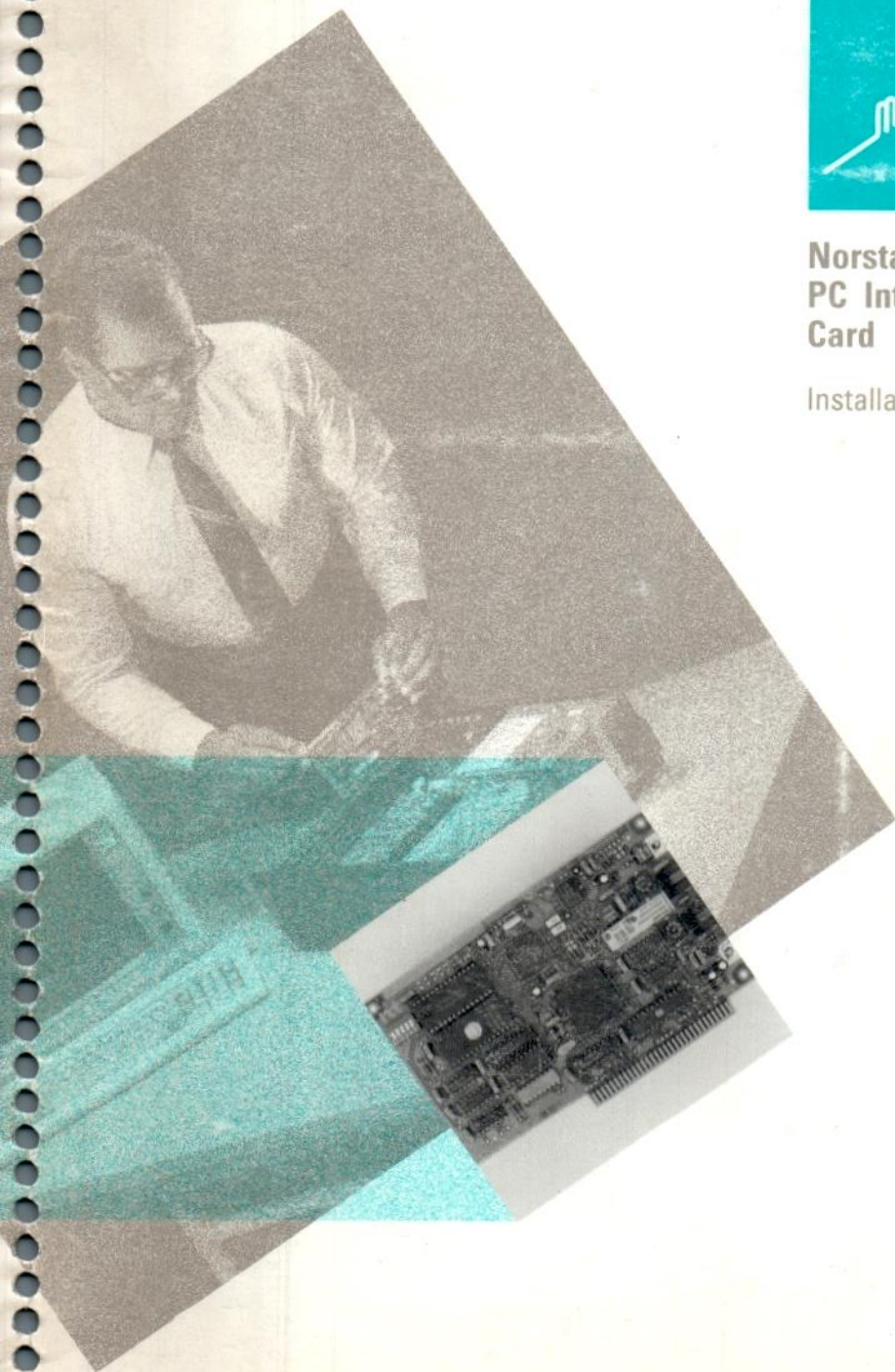
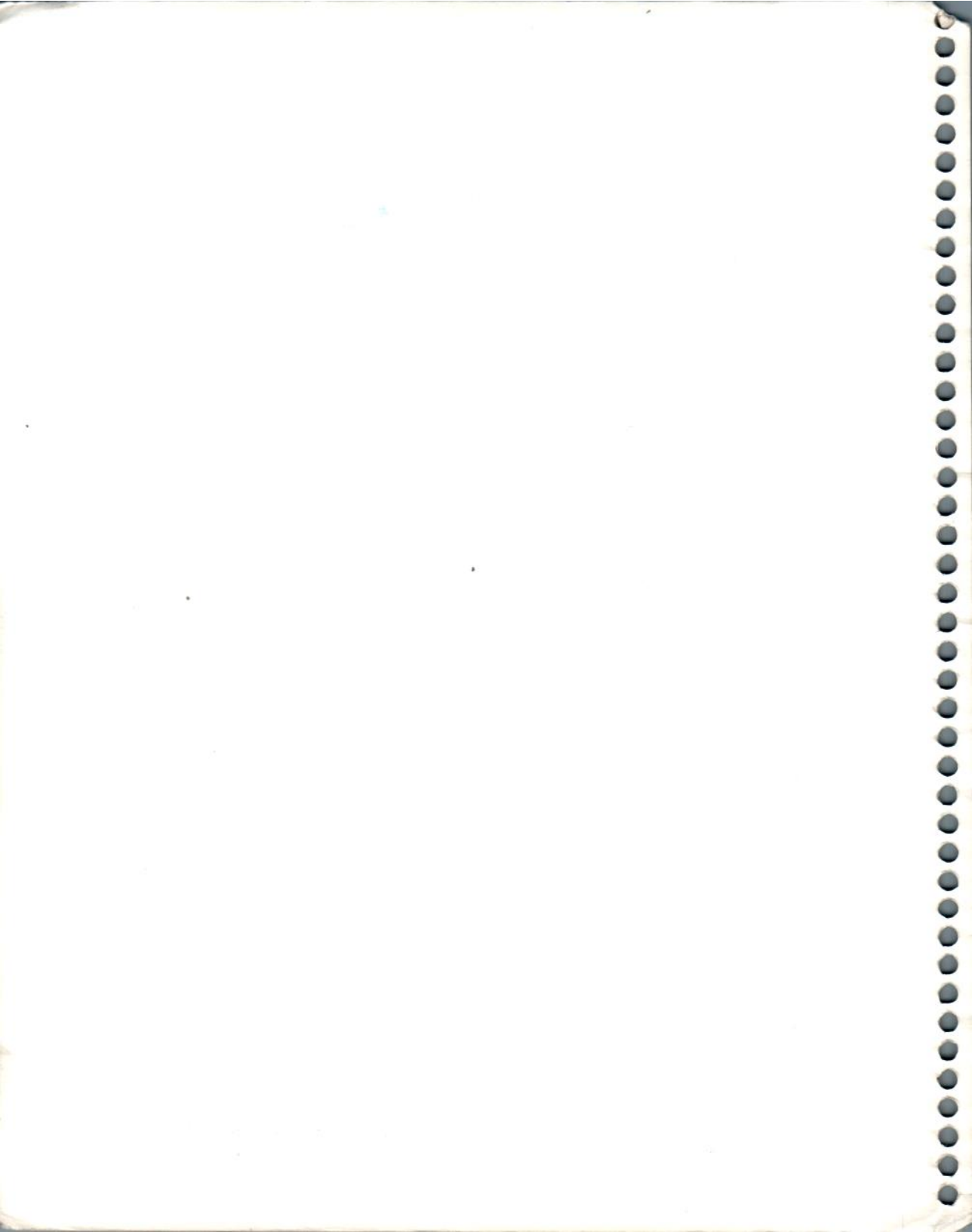




**Norstar  
PC Interface  
Card**

Installation Guide





---

## FCC WARNING

This equipment generates, uses and can radiate radio frequency energy. If not installed and used with the instruction manual, it may cause interference to radio communications. It has been tested and found to comply with limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

---

## WARNING Interference

This digital apparatus does not exceed the (Class A) limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

---

## WARNINGS Summary

1. To avoid electrical shock, read all of the installation instructions before you proceed. Follow all warnings and cautions when you install, remove and operate the PC Interface card. For further installation instructions, refer to the documentation that came with your specific PC.
  2. To avoid electrical shock, only disconnect all power connections from the PC before you install or remove the PC Interface card.
  3. To avoid electrical shock and fire hazard, connect the PC Interface card jack labeled "LINE" to a Norstar KSU and the jack labeled "PHONE" to a Norstar telephone.
  4. To avoid electrical shock, do not operate the PC Interface card with the PC cover removed.
- 

## CAUTIONS Summary

1. Save all instructions for later use.
  2. Install the PC Interface card according to the installation instructions provided in this guide.
- 

In the event of equipment malfunction, contact your authorized Norstar dealer or contact Northern Telecom at one of the following locations:

USA: Northern Telecom Inc.  
Product Service Center  
720 Massman Drive  
Nashville, TN  
37210

CANADA: Northern Telecom Inc.  
Telecom Service Division  
30 Norelco Drive  
Weston, Ontario  
M9L 2X6





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# How to use this Guide

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## About this Guide

This **Meridian Norstar\* PC Interface Card Installation Guide** gives you detailed information on how to install the Meridian Norstar PC Interface card and software. PC Interface is sometimes abbreviated as PCI.

---

### Read Me First Card

Please read the **Read Me First** card before you begin reading this guide. The **Read Me First** card gives you an overview of the major steps. An experienced installer could probably work directly from the **Read Me First** card; a less experienced installer may want to refer to the more detailed installation instructions in this guide.

---

### Instructions Typed on Your PC Keyboard

Letters, words and phrases that you type on the PC keyboard are shown in a different type style. For example:

Type **a:install b:**

---

### Keys

Keys that you press on your PC keyboard or telephone dialpad are shown in boxes. For example: **Enter** or **Rls**

---

### Numbered Steps

The numbered steps on the **Read Me First** card correspond to the sections in this installation guide. Illustrations are also provided in this guide to help you visualize the installation.

---

\* Meridian and Norstar are trademarks of Northern Telecom.

This guide contains the following sections and appendixes:

---

**STEP ONE: Setting the Address Switches**

This step shows you how to set the address switches on the PC Interface card.

---

**STEP TWO: Installing the PCI Card**

This step tells you how to install the PC Interface card in your PC.

---

**STEP THREE: Connecting the PCI Card to Norstar**

This step outlines the procedures for connecting your PC to the Meridian Norstar Business Communication System.

---

**STEP FOUR: Installing the Software on a Dual Floppy Disk PC**

This step tells you how to install the PC Interface software on a PC that has two floppy disk drives and no hard disk.

---

**STEP FIVE: Installing the Software on a PC with a Hard Disk**

This step tells you how to install the PC Interface software on a PC that has a hard disk.

---

**STEP SIX: Using the PCI Test Program**

The last procedure of the installation process tells you how to use a Meridian Norstar telephone in conjunction with the PC to check that the installed hardware and software function properly.

**Appendix A: Installation Troubleshooting**

This appendix contains a list of possible errors that may occur while you are installing the software, and offers solutions to these errors.

---

**Appendix B: PCI Technical Reference**

This appendix contains a more detailed explanation of how the PC Interface software operates, and provides an extensive troubleshooting guide.

---

**Appendix C: Meridian Norstar PC Interface Files**

This appendix contains a detailed description of the programs and files found on the **Meridian Norstar PC Interface Software Disk**.

---

**Appendix D: PC Compatibility**

This appendix lists the hardware and software that have been proven to be compatible with the PC Interface card and software.

---

**Appendix E: Creating a Custom Boot Disk**

This appendix explains how you can create your own custom DOS boot disk.

---

**Appendix F: Attached Set Requirements**

This appendix lists the Norstar sets that can be connected to the PC Interface card and describes the installation conditions that must be met.





---

# Meridian Norstar PC Interface Card Installation

---

This installation guide contains instructions for installing the PC Interface card and PC Interface software.

Once the PC Interface card and software have been installed, your PC will be able to communicate with your Meridian Norstar Business Communication System.

**The PC Interface software installation is automatic. Once the installation is complete, a test program is provided to help you verify that your PC and the Meridian Norstar Business Communication System can communicate.**

After the PC Interface card has been installed, you can use PC applications such as Meridian Norstar Dial-by-Name Directory and Meridian Norstar Call Detail Recording.



# 1

## STEP ONE: Setting the Address Switches

**CAUTION:** Handle the PC Interface card by the metal bracket and edges. This will reduce the possibility of a static discharge to the card.

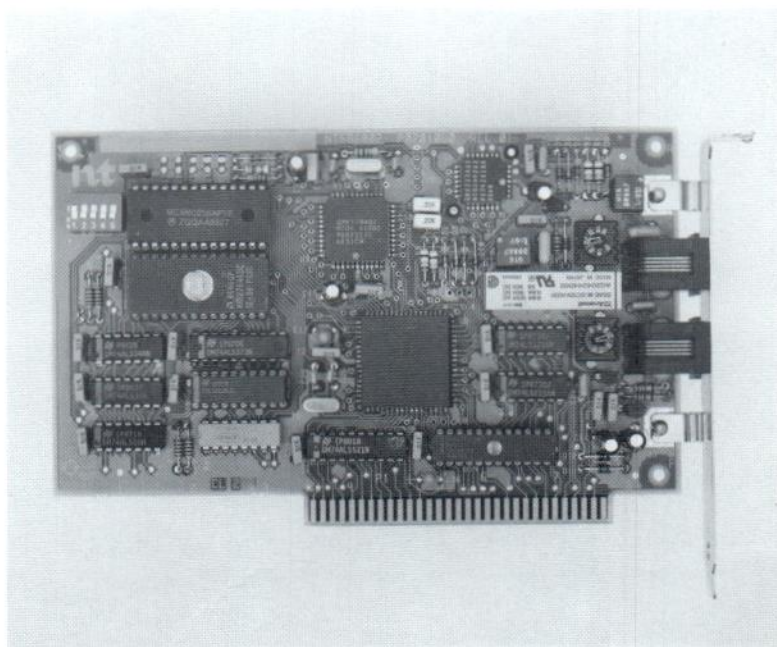


Figure 1.1 Meridian Norstar PC Interface card

## Setting the Switches

Each PC Interface card comes with the address switches preset.

1. Ensure that the switches are set as shown in Figure 1.2.  
This sets the PC Interface card to operate at address 300H.

**CAUTION:** Do not use a pencil to adjust the switch positions; graphite deposits from the pencil lead can cause a short in the switch.

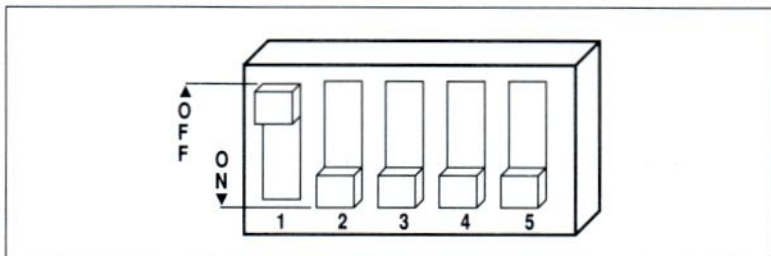


Figure 1.2 Address switch settings



# 2

## STEP TWO: Installing the PCI Card

This chapter explains the procedures for installing the PC Interface card in your PC. There are two separate sections that cover the installation of the card:

- The first section is for the IBM PC\*, IBM PC/XT\*, and IBM PC/AT\*, and compatible computers.
- The second section is for the IBM Personal System/2 Model 30\*.

If you already know how to install a card in a PC, you may wish to refer to the **Read Me First** card for a quick overview.

**For more information on installing a card in your particular PC, consult your PC Owner's Manual.**

\* IBM PC, IBM PC/XT, IBM PC/AT and IBM Personal System/2 Model 30 are trademarks of International Business Machines Corporation.

## **Installing the PCI Card in an IBM PC/AT**

This section describes the installation procedures used for IBM PC, IBM PC/XT, IBM PC/AT, and compatible computers.

During this step you will be performing the following tasks:

- Removing the PC cover
- Installing the card
- Replacing the PC cover

**For instructions on how to install the card in an IBM PS/2 Model 30, turn to page 15.**

---

### **Before You Begin**

Make sure that the area where you will be placing the PC is equipped with a Teledapt\* jack connected to the Meridian Norstar Business Communication System. The PC Interface card does not need a dedicated Norstar phone line. It can share the phone line with a Norstar phone.

If no jack is available, call your installer to have a Teledapt jack installed.

---

### **Getting Ready**

1. Give yourself room to work; clear your work area of everything but the PC.
2. Turn the PC power switch to the OFF position.
3. Unplug the PC power cord from the wall outlet.
4. Make sure that you have the proper size screwdrivers for the task.

\* Teledapt is a trademark of Northern Telecom.

## Removing the Screws

The PC cover is secured with retaining screws that are located around the perimeter of the PC's rear panel (Figure 2.1).

**Be careful not to remove any screws from the rear panel that holds the internal components in place.**

1. Locate and remove the cover's retaining screws (Figure 2.1).

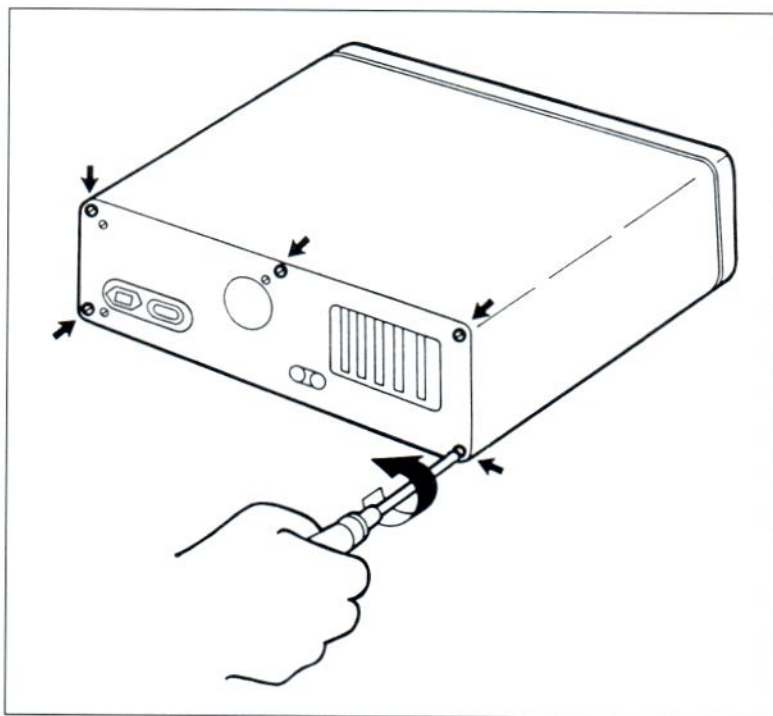


Figure 2.1 Removing the retaining screws

## Removing the Outer Cover

1. Slide the cover forward and set it aside (Figure 2.2).

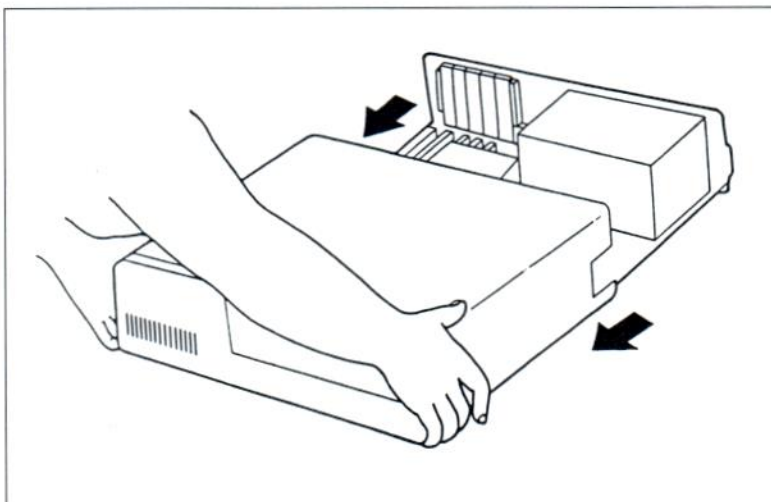


Figure 2.2 Removing the outer cover

On some PC models, the cover comes to a mechanical stop near the end of its travel.

1. Tilt the cover up, remove it and set it aside (Figure 2.3).

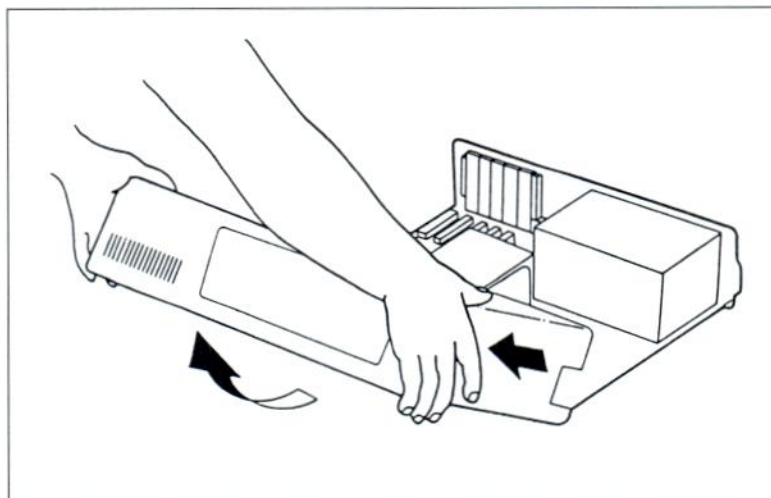


Figure 2.3 Removing the outer cover

## Locating the Expansion Slots

Some PCs have as few as three expansion slots while others have as many as ten. The slots are usually mounted vertically inside the PC on the back left side (Figure 2.4).

**The PC Interface card can be installed in any unused slot.**

1. Select an unused slot to install the PC Interface card.

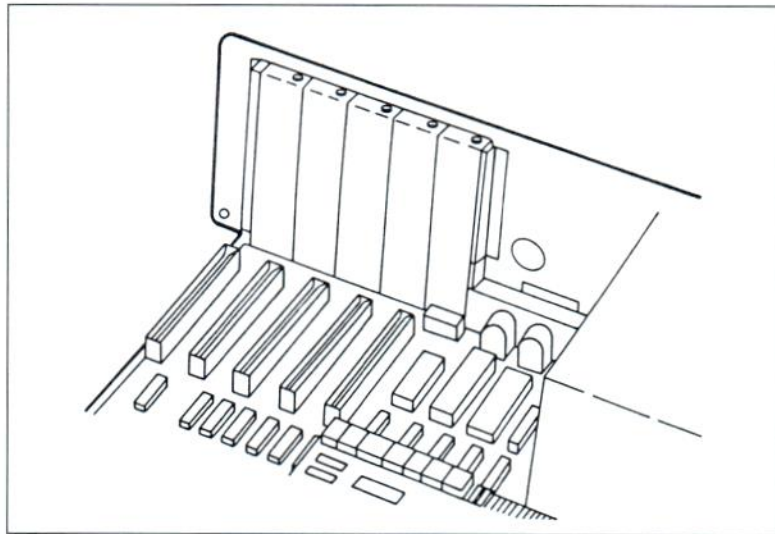


Figure 2.4 Expansion slots



## Removing the Expansion Slot Cover

1. Remove the cover of the selected expansion slot from the rear panel of the PC (Figure 2.5).
2. Save the retaining screw for fastening the PC Interface card to the PC.

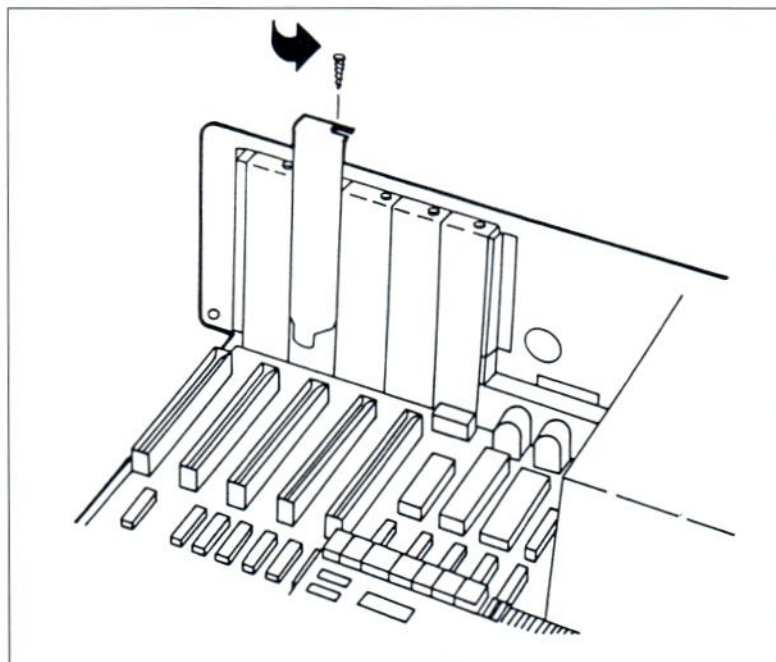


Figure 2.5 Removing the expansion slot cover

## Installing the PCI Card

1. Insert the PC Interface card into the selected slot (Figure 2.6).

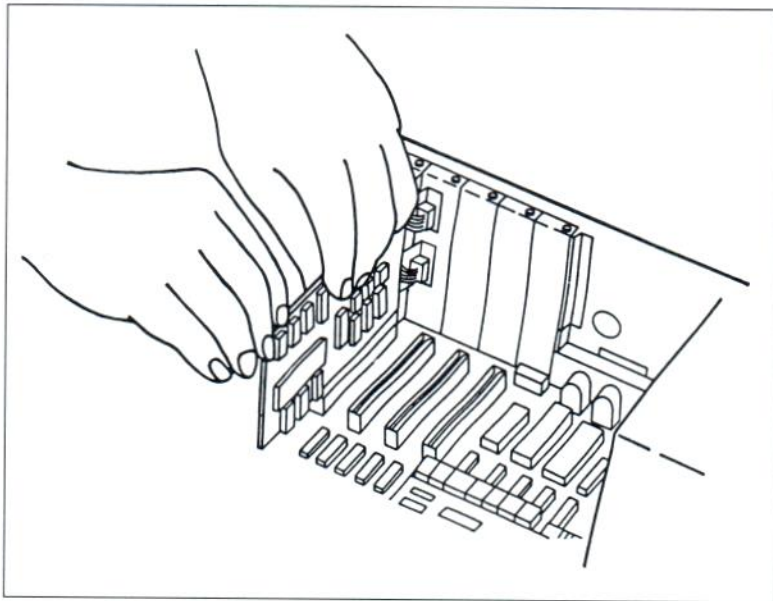


Figure 2.6 Installing the card in the expansion slot

**Installing the  
PCI Card  
(cont'd)**

2. Align the elongated notch on the PC Interface card bracket with the screw hole in the rear panel (Figure 2.7).
3. Insert and tighten the retaining screw that you removed earlier.

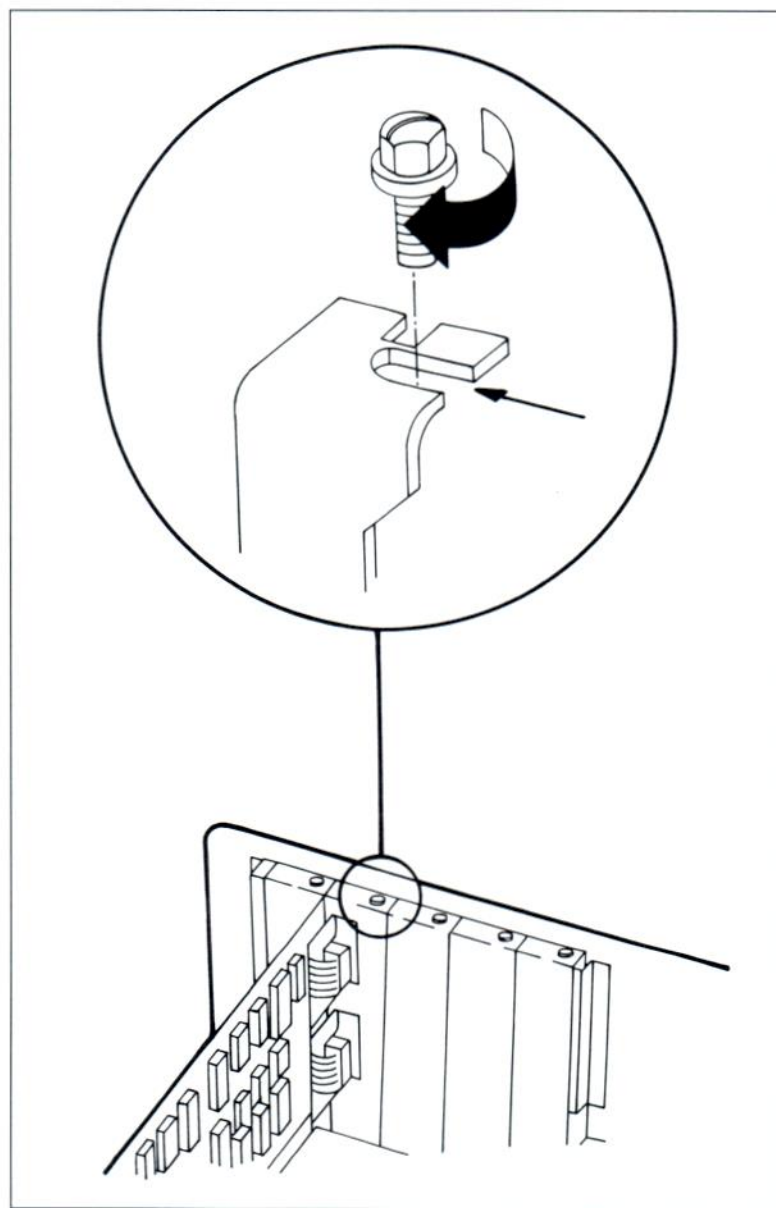


Figure 2.7 Aligning the elongated notch in the card slot

## Replacing the Outer Cover

**CAUTION:** Make sure no internal wires are caught by the PC cover as you replace it.

1. Replace the PC's cover (Figure 2.8 and Figure 2.9) and secure it using the retaining screws that you removed earlier.

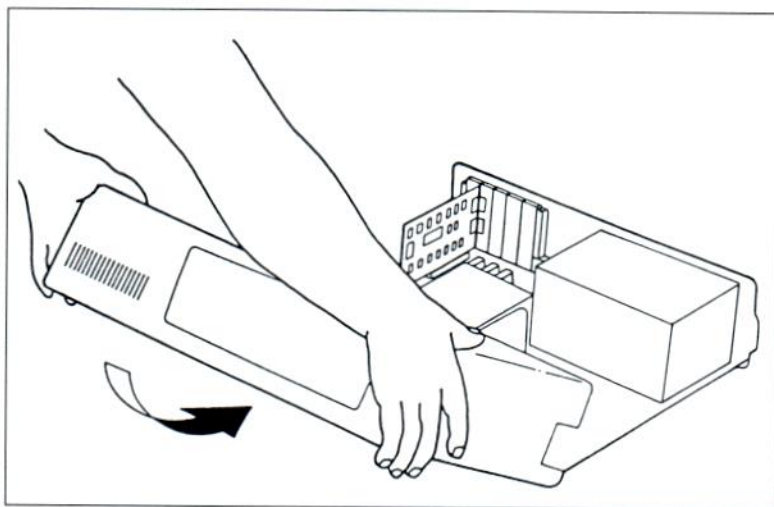


Figure 2.8 Replacing the outer cover

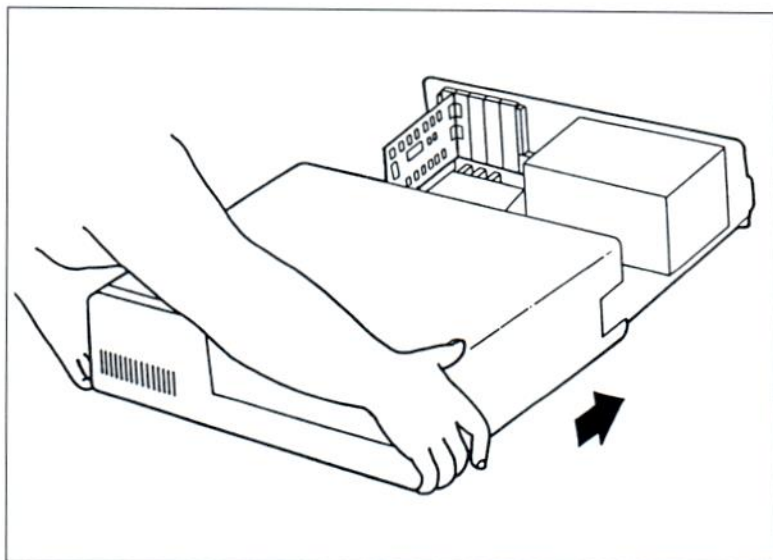


Figure 2.9 Replacing the outer cover

**Returning the  
PC to Service**

1. Plug the PC power cord into the outlet.
2. Turn the PC power switch to the ON position. This returns the PC to service.
3. Go to **STEP THREE: Connecting the PCI Card to Norstar.**



## **Installing the PCI Card in an IBM PS/2 Model 30**

During this step you will be performing the following tasks:

- Removing the PC cover
  - Installing the card
  - Replacing the PC cover
- 

### **Before You Begin**

Make sure that the area where you will be placing the PC is equipped with a Teledapt jack connected to the Meridian Norstar Business Communication System. The PC Interface card does not need a dedicated Norstar phone line. It can share the phone line with a Norstar phone.

If no jack is available, call your installer to have a Teledapt jack installed.

---

### **Getting Ready**

1. Give yourself room to work; clear your work area of everything but the PC.
2. Turn the PC power switch to the OFF position.
3. Unplug the PC power cord from the wall outlet.
4. Make sure that you have the proper size screwdrivers for the task.

## Loosening the Screws

The four retaining screws are located on the side panels of the PC cover. The screws are held captive and only loosen; they do not come all the way out.

1. Locate and loosen the cover's retaining screws as far as they will go (Figure 2.10).

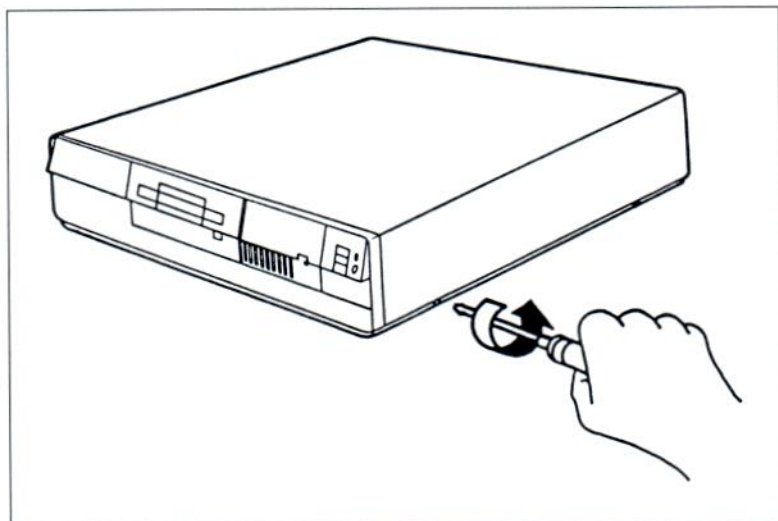


Figure 2.10 Loosening the retaining screws

## Removing the Outer Cover

1. Move the cover approximately one centimeter (1/2 inch) toward the rear and lift it straight up (Figure 2.11).

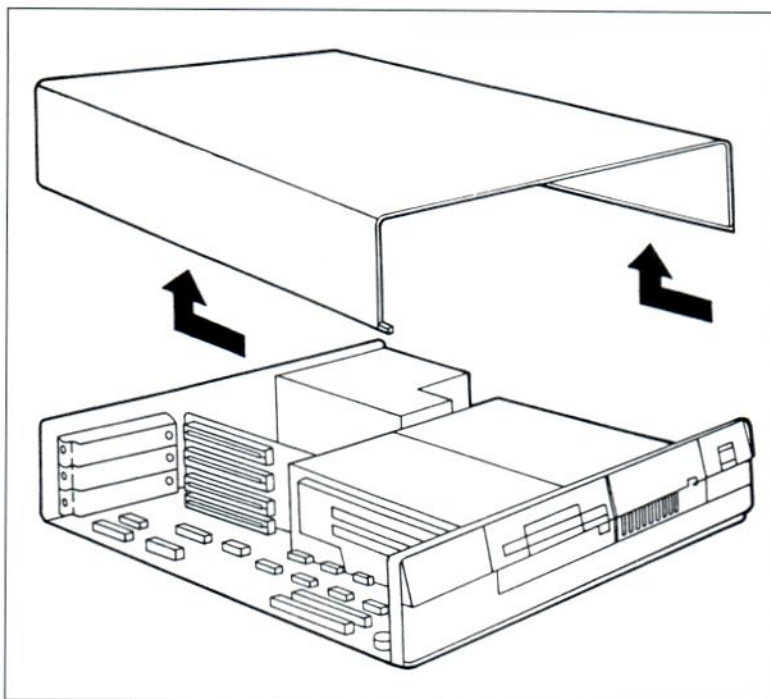


Figure 2.11 Removing the outer cover

## Locating the Expansion Slots

The IBM Personal System/2 Model 30 computer contains three horizontally mounted expansion slots in the left rear corner of the computer (Figure 2.12).

**The PC Interface card can be installed in any unused slot.**

1. Select an unused slot to install the PC Interface card.

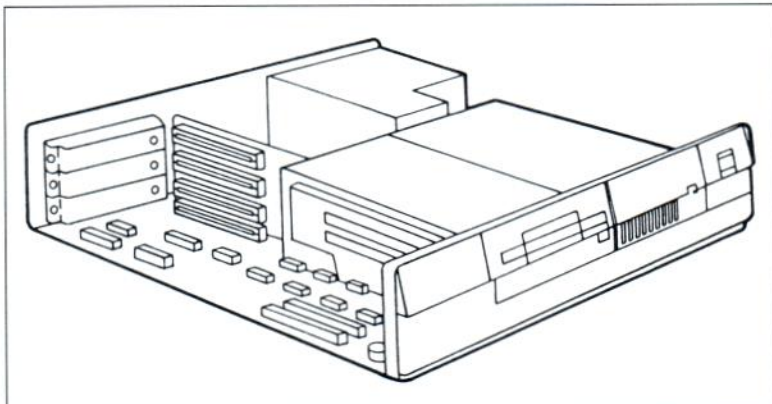


Figure 2.12 Expansion slots

## Removing the Expansion Slot Cover

1. Remove the cover of the selected expansion slot from the rear panel (Figure 2.13).
2. Save the retaining screw for fastening the PC Interface card to the PC.

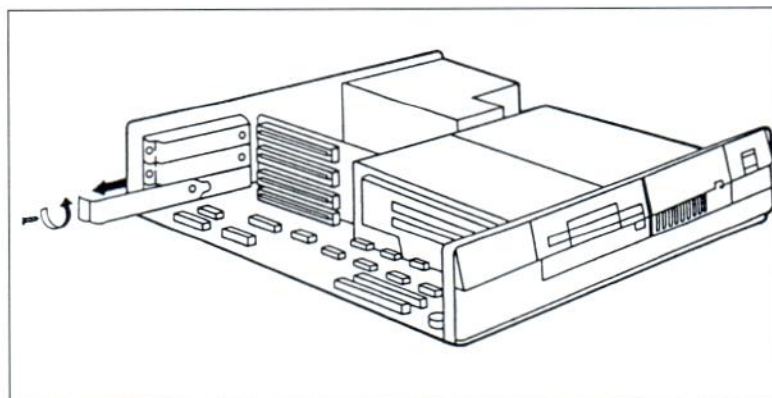


Figure 2.13 Removing the expansion slot cover

## Removing the Plastic Insert

A plastic insert covers the selected expansion slot on the rear panel.

1. Use your screwdriver to remove the plastic insert (Figure 2.14). You can then discard the insert.

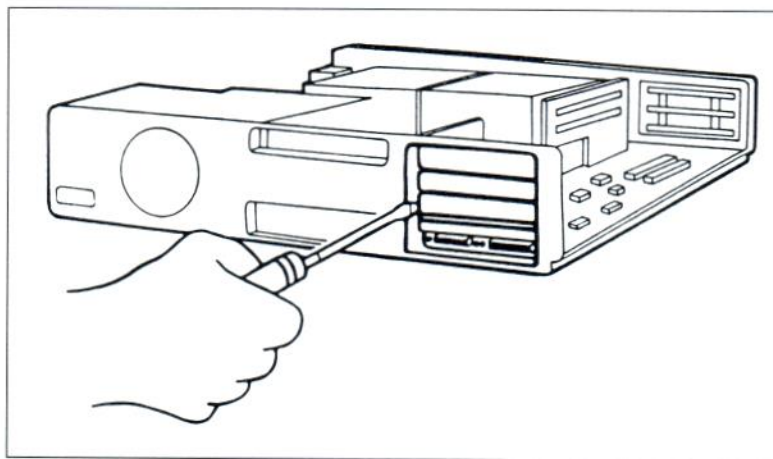


Figure 2.14 Removing the plastic insert



## Installing the PCI Card

1. Insert the PC Interface card into the selected slot (Figure 2.15).

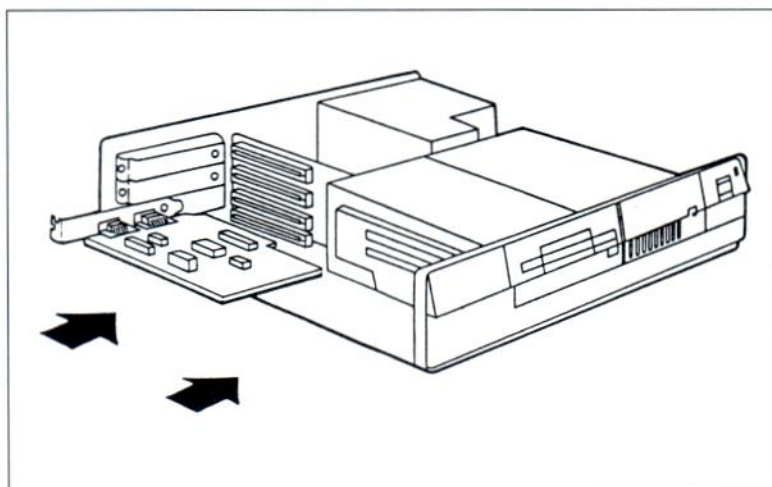


Figure 2.15 Installing the card in the expansion slot

2. Align the elongated notch on the PC Interface card bracket with the screw hole in the rear panel (Figure 2.16).
3. Insert and tighten the retaining screw that you removed earlier.

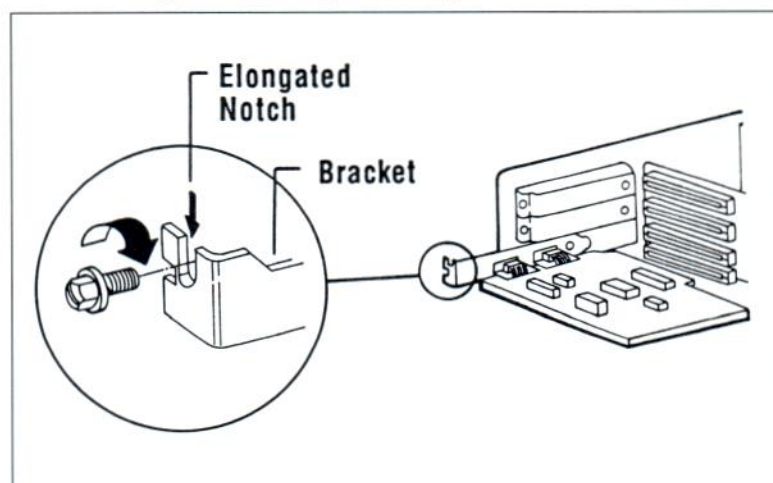


Figure 2.16 Aligning the elongated notch

**Replacing the  
Outer Cover**

1. Replace the cover (Figure 2.17).

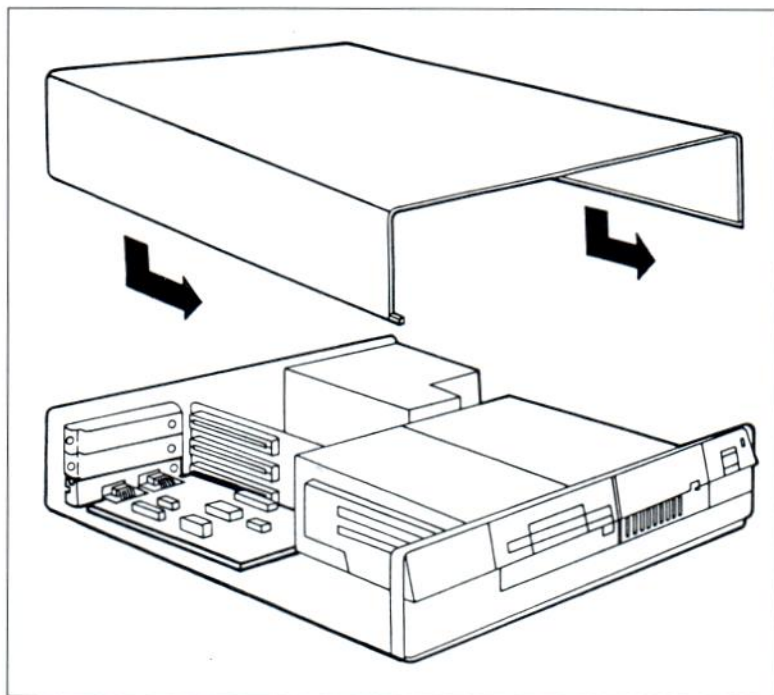


Figure 2.17 Replacing the outer cover

### Replacing the Outer Cover (cont'd)

2. When the cover is on the IBM Personal System/2 Model 30, tighten the loosened screws (Figure 2.18).

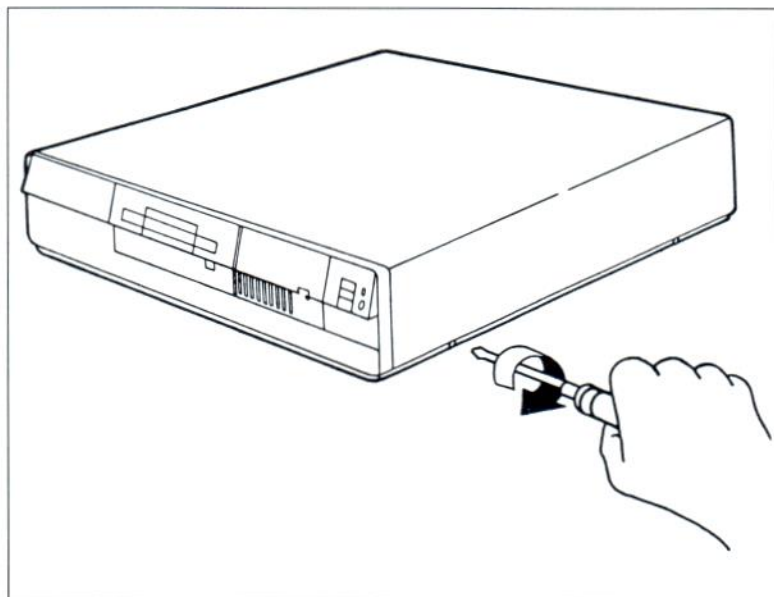


Figure 2.18 Tightening cover screws

### Returning the PC to Service

1. Plug the PC power cord into the outlet.
2. Turn the PC power switch to the ON position. This returns the PC to service.
3. Go to **STEP THREE: Connecting the PCI Card to Norstar.**

## 3

## STEP THREE: Connecting the PCI Card to Norstar

This chapter contains instructions for connecting the PC Interface card to the Norstar Business Communication System. **Appendix F: Attached Set Requirements** lists the conditions that must be met so that the PC Interface card and phone can share the same line.

1. If there is a Norstar telephone plugged into the Norstar Teledapt jack that you want to use, unplug it.
2. Plug one end of the line cord (provided with the PC Interface card) into the Norstar Teledapt jack.

3. Plug the other end of the line cord into the jack labeled "LINE" on the PC Interface card.
4. If you wish, plug the Norstar telephone into the jack labeled "PHONE" on the PC Interface card.
5. If you have a system with two floppy drives and no hard disk, go to **STEP FOUR: Installing the Software on a Dual Floppy Disk PC**  
**OR**  
If you have a system with a hard disk, go to **STEP FIVE: Installing the Software on a PC with a Hard Disk.**

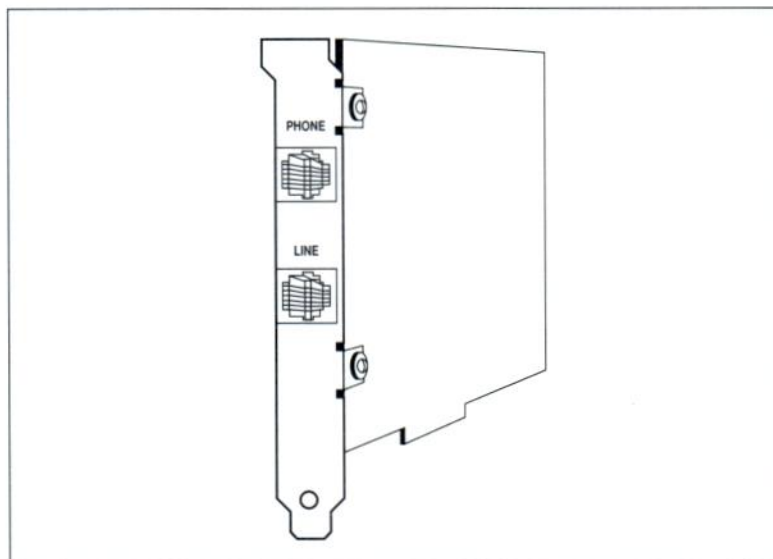


Figure 3.1 The "LINE" and "PHONE" jacks on the PC Interface card



# 4

## STEP FOUR: Installing the Software on a Dual Floppy Disk PC

Once you have installed the PC Interface card and connected it to the Meridian Norstar Business Communication System, you are ready to install the PC Interface software. This software contains an automatic installation program that performs the following steps:

- It copies the appropriate files from the **PC Interface Software Disk** onto your working disk. For a list of the files that are copied, see **Appendix C: Meridian Norstar PC Interface Files** in this guide.
- It runs a test on your PC to check that the PC Interface card and software are running properly.
- It makes the appropriate changes to your AUTOEXEC.BAT file.

The following page shows an overview of the software installation for a PC with two floppy disk drives and no hard disk (Chart 4.1).

## Overview

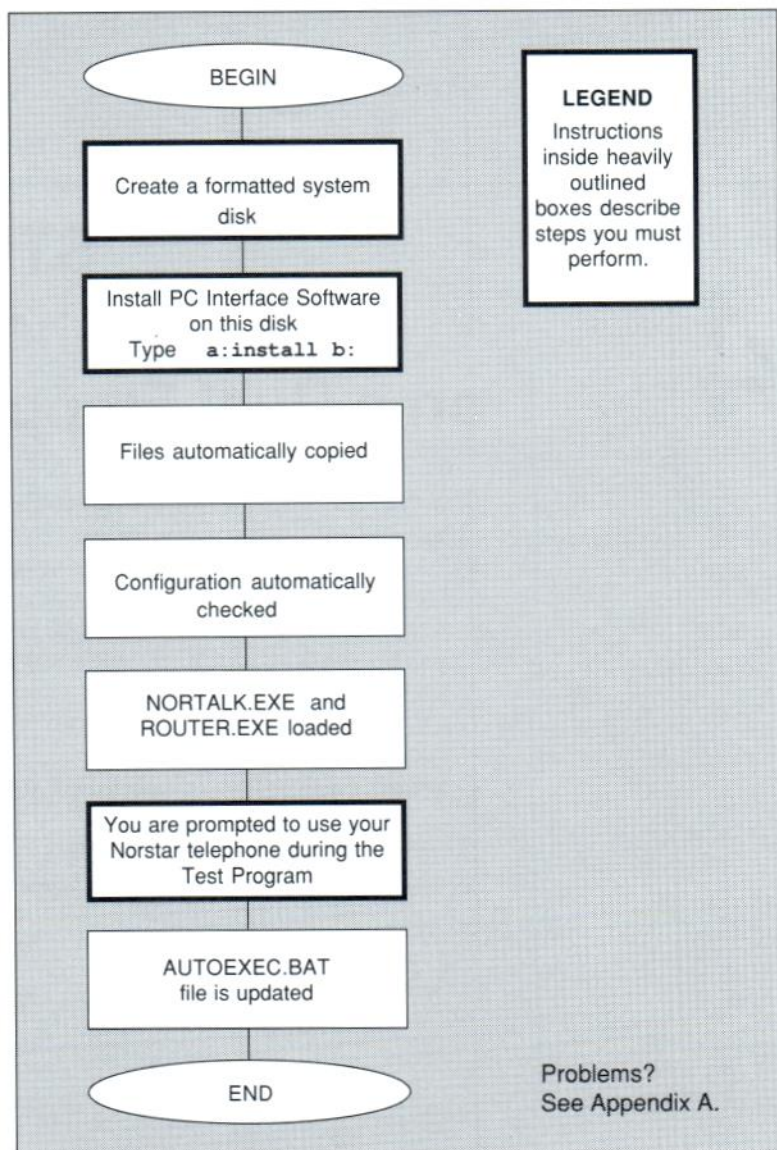


Chart 4.1 Installation on a PC with two disk drives

If you encounter difficulty while the PC Interface software is being installed, refer to Appendix A: Installation Troubleshooting.

## Creating a Norstar System Disk

You must create a **Norstar System Disk** in order to use the PC Interface software on a system with two disk drives. You cannot use the **PC Interface Software Disk** to boot your PC.

Once it is created, the **Norstar System Disk** will contain the programs for products such as Meridian Norstar Dial-by-Name Directory. The installation procedures for these products tell you how to update your **Norstar System Disk**.

If you would like to use your own DOS system disk rather than the **Norstar System Disk**, see **Appendix E: Creating a Custom Boot Disk**.

### Formatting a disk

**CAUTION:** Formatting a disk will erase all previous information on the disk.

1. Label an unformatted disk: **Norstar System Disk**.
2. Place your DOS system disk in drive A.
3. Place the unformatted floppy disk in drive B.
4. Type `format b: /s`
5. Press

### Creating your Norstar System Disk

1. Place the **PC Interface Software Disk** in drive A.
2. Leave the newly formatted disk in drive B.
3. Type `a:install b:`
4. Press

### Automatic Copying of the Files

Once you have completed the above steps, the `INSTALL.BAT` file creates a directory, `B:\NORSTAR\SYS`, on your **Norstar System Disk** and copies the PC Interface software into it. File names appear on the screen as they are copied.

Refer to **Appendix C** for a complete list of the files copied onto your disk. After the files are copied, the PC Interface card and software are automatically configured.



### **NORTALK.EXE Runs Automatically**

Once configuration is complete, the PC Interface driver program, NORTALK.EXE, runs automatically. When this program runs, it displays the Northern Telecom copyright notice along with configuration information. You do not have to copy down the configuration information.

### **ROUTER.EXE Runs Automatically**

After the NORTALK.EXE program has run, the ROUTER.EXE program runs automatically. This program allows several Norstar PC applications to run at the same time. The ROUTER.EXE program must be run before you can run any Norstar PC application.

## **Running the Test Program**

After you are prompted from the PC screen, you may begin the PC Interface test program.

1. Follow **STEP SIX: Meridian Norstar PC Interface Test Program**.
2. Return to this point after you have completed the test.

### **AUTOEXEC.BAT File Created**

If the PC Interface test program is successful, your AUTOEXEC.BAT file is automatically updated. As a result, the PC Interface driver program, NORTALK.EXE and the ROUTER.EXE program run when you boot your PC using the **Norstar System Disk**.

For more information on the AUTOEXEC.BAT file, see **Appendix B: PCI Technical Reference** in this guide.

You have successfully installed the PC Interface card and software. You are now ready to install your PC applications.

**CAUTION:** In order for your Meridian Norstar PC applications to work on your PC you must always boot your PC using the Norstar System Disk.

## Booting Your PC

To boot your PC using the **Norstar System Disk**:

1. Turn your PC OFF.
2. Place the **Norstar System Disk** in drive A while the PC is turned OFF.
3. Turn the PC ON.
4. Once your PC has finished booting, remove your **Norstar System Disk** from drive A. You can now insert your DOS system disk or the application disk you will be using.
5. Store your **PC Interface Software Disk** in a safe place.

All the files needed to operate the PC Interface card have been copied to your **Norstar System Disk**.

**CAUTION:** Do not delete any of the files or directories found on the **Norstar System Disk**. If you do this, the PC Interface software will not run properly.





# 5

## STEP FIVE: Installing the Software on a PC with a Hard Disk

Once you have installed the PC Interface card and connected it to the Meridian Norstar Business Communication System, you are ready to install the PC Interface software. This software contains an installation program that performs the following steps:

- It copies the appropriate files from the **PC Interface Software Disk** onto your working disk. For a list of the files which are copied, see **Appendix C** in this guide.
- It runs a test on your PC to check that the PC Interface card and software are running properly.
- It makes the appropriate changes to your AUTOEXEC.BAT file.

On the following page is an overview of the installation of PC Interface software on a PC with a hard disk (Chart 5.1).

## Overview

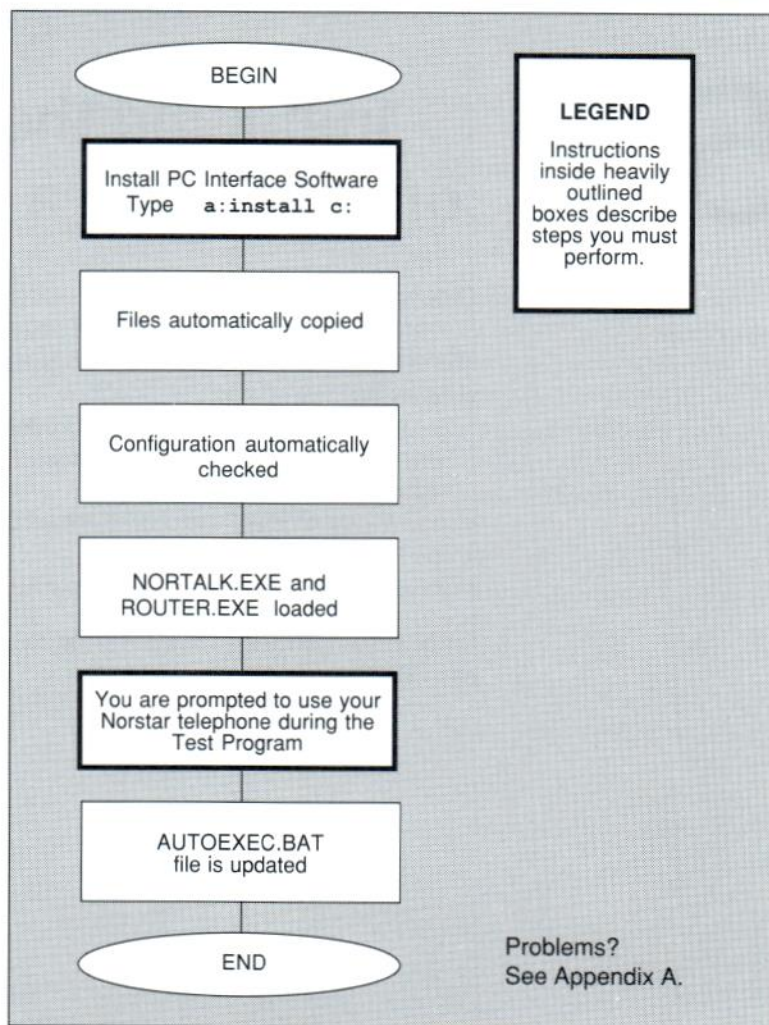


Chart 5.1 Installation on a PC with a hard disk

**If you encounter difficulty while the PC Interface software is being installed, refer to Appendix A: Installation Troubleshooting.**

## Installation on a Hard Disk

To install the PC Interface software on your hard disk:

1. Place the **PC Interface Software Disk** into drive A.
2. Type **a:install c:**
3. Press

---

### Automatic Copying of the Files

Once you have completed the above steps, the INSTALL.BAT file creates the directory, C:\NORSTAR\SYS, on your hard disk and copies the PC Interface software into it. File names appear on the screen as they are copied.

Refer to **Appendix C** for a complete list of the files copied onto your disk. After the files are copied, the PC Interface card and software are automatically configured.

### NORTALK.EXE Runs Automatically

Once configuration is complete, the PC Interface driver program, NORTALK.EXE, runs automatically. When this program runs, it displays the Northern Telecom copyright notice along with configuration information. You do not have to copy down the configuration information.

### ROUTER.EXE Runs Automatically

After the NORTALK.EXE program has run, the ROUTER.EXE program runs automatically. This program allows several Norstar PC applications to run at the same time. The ROUTER.EXE program must be run before you can run any Norstar PC application.

## Running the Test Program

After the configuration information is shown, you are prompted from the PC screen to begin the Meridian Norstar PC Interface test program.

1. Follow **STEP SIX: Meridian Norstar PC Interface Test Program**.
2. Return to this point after you have completed the test.

**Note:** After you have run the test program, some additional data files may be copied.

### **AUTOEXEC.BAT File Created**

If the PC Interface test program is successful, your AUTOEXEC.BAT file is automatically updated. As a result the PC Interface driver program, NORTALK.EXE and ROUTER.EXE run every time you reboot or turn your PC ON.

For more information on the AUTOEXEC.BAT file, see **Appendix B: PCI Technical Reference** in this guide.

Store your **PC Interface Software Disk** in a safe place. All the files needed to operate the PC Interface card have been copied to your PC's hard disk.

You have successfully installed the PC Interface card and software.

You are now ready to install your PC applications.

**CAUTION: Do not delete any of the files found in \NORSTAR\SYS directory or the PC Interface software will not run properly.**



# 6

## STEP SIX: Meridian Norstar PC Interface Test Program

The PC Interface test program, NTEST.EXE, ensures that the Meridian Norstar hardware and software installed in your PC function properly, and can communicate with a Meridian Norstar telephone.

### Start Test Program

The NTEST.EXE test program runs automatically when you install your PC Interface software. You can also run NTEST.EXE directly from DOS by following the steps below:

1. Type `cd \norstar\sys`
2. Press
3. Type `ntest`
4. Press

### Test Program Operation

1. Press any key on the PC to start the test. Follow the prompts displayed on your screen to complete the test.
2. Use any Meridian Norstar telephone to dial the feature code displayed on your screen.  appears on your telephone's display.
3. Dial any numbers on the telephone dialpad and check to see that the corresponding numbers appear on the PC screen. This verifies that your PC Interface software is functioning correctly.

4. Press  on the telephone to end the test.
5. Return to **STEP FOUR: Installing the Software on a Dual Floppy Disk PC.**  
**OR**

Return to **STEP FIVE: Installing the Software on a PC with a Hard Disk.**

---

## Appendix A: Installation Troubleshooting

---

This appendix lists the four major types of problems you may encounter during installation:

- switch warning
- telephone line not connected
- PC not responding to keyboard input
- DOS errors during automatic installation

If you encounter problems that are not explained in this appendix, refer to **Appendix B: PCI Technical Reference** in this guide.

## Switch Warning

If your screen displays this warning after running the CONFIG.EXE program, follow the steps below.

### WARNING

The Norstar PC Interface Card is NOT responding at the specified address.

Make sure the card is installed and the switches on the card are set as shown below:

This warning means that you now must set the switches as shown on your screen and then repeat the installation process.

### Setting the Switches

1. Record the correct address switch positions shown on the screen.
2. Open the PC and remove your PC Interface card. Consult **STEP TWO: Installing the PCI Card** if you need help.
3. Set the switches on your PC Interface card to the positions that you have recorded.
4. Follow the instructions in **STEP TWO: Installing the PCI Card** to re-install the PC Interface card.

### Repeating the Software Installation Procedure

If you have a dual floppy disk system:

1. Place the **PC Interface Software Disk** in drive A
2. Type **a:install b:**
3. Press

This repeats the automatic software installation process.

If you have a hard disk:

1. Place the **PC Interface Software Disk** in drive A
2. Type **a:install c:**
3. Press

This repeats the automatic software installation process.

**If after performing these steps you still receive the same warning message, see Appendix B: PCI Technical Reference.**

## Telephone Line Not Connected

If, after running the NTEST.EXE test program, your screen displays this warning, follow the steps below.

An ERROR occurred while initializing the  
Norstar PC Interface:

ERROR #1: The PCI Card is not connected  
to the Norstar system.

This warning means that you must check the connections between the PC Interface card and your Meridian Norstar system.

### Checking the Connections

1. Make sure that the line cord plugged into the Teledapt jack labeled LINE on the PC Interface card is connected to the Norstar Teledapt jack on the wall.
2. Make sure that the line cord plugged into the Teledapt jack labeled PHONE on the PC Interface card is connected to a Norstar telephone (if used).

### Repeating the Software Installation Procedure

If you have a dual floppy disk system:

1. Place the **PC Interface Software Disk** in drive A
2. Type **a:install b:**
3. Press

This repeats the automatic software installation process.

If you have a hard disk:

1. Place the **PC Interface Software Disk** in drive A
2. Type **a:install c:**
3. Press

This repeats the automatic software installation process.

**Once the PC Interface test program runs without errors, you have successfully installed the PC Interface card and software. You can now install PC applications.**



**If error  
still occurs**

If you still receive the error message when you run the PC Interface test program:

1. Unplug the line cord from the Teledapt jack in the wall.
  2. Plug a Meridian Norstar telephone into the jack.
  3. Check to see if the telephone is working. (The display will show the time and date if the telephone is working correctly.)
- 

If the telephone is working:

1. Try using a different line cord between your PC and the Teledapt jack.
- 

If the telephone is not working:

1. Contact the installer of your Meridian Norstar system.
-

## PC Not Responding To Keyboard Input

If, after running the NORTALK.EXE, ROUTER.EXE or the NTEST.EXE test program, your PC is not responding to keyboard input, you must turn your PC OFF. Follow the manual configuration process and repeat the software installation process.

### Configuring your PC Manually

1. Turn the PC power switch to the OFF position.
2. Wait 30 seconds.
3. Turn the PC power switch to the ON position.

If you have a dual floppy disk system:

1. Place the **Norstar System Disk** in drive A
2. Type **a :**
3. Press

If you have a hard disk:

1. Type **c :**
2. Press

To continue with the installation process:

1. Type **cd \norstar\sys**
2. Press
3. Type **config**
4. Press  This runs the PC Interface configuration program.  
A prompt screen appears which allows you to change the configuration settings for your PC.
5. Select **Manual** using the cursor control keys, and then press  A prompt screen displaying the current PC Interface configuration parameters appears on your PC.

*If you have an IBM PC, IBM PC/XT, compatible, or an IBM PS/2 Model computer:*

6. Press  on your keyboard to select an alternate configuration.  
**OR**

*If you have an IBM PC/AT or compatible:*

- Press  on your keyboard to select an alternate configuration.
  7. Notice that the parameters in the Setting Box change as you select alternate settings.
  8. Press  when you have chosen a setting.
  9. Press  to save the configuration and exit.
- You are now ready to repeat the software installation procedure.

## Repeating the Software Installation Procedure

If you have a dual floppy disk system:

1. Place the **PC Interface Software Disk** in drive A
2. Type `a:install b:`
3. Press

This repeats the automatic software installation process.

If you have a hard disk:

1. Place the **PC Interface Software Disk** in drive A
2. Type `a:install c:`
3. Press

This repeats the automatic software installation process.

**Once the PC Interface test program runs without errors, you have successfully installed the PC Interface card and software. You can now install PC applications.**

## DOS Errors During Automatic Installation

The batch file INSTALL.BAT uses DOS commands to create the \NORSTAR and \NORSTAR\SYS directories and to copy the PC Interface software files into the \NORSTAR\SYS directory. If these DOS commands fail, errors are reported on your screen.

### If DOS Errors Occur

1. Press **CTRL C** to halt the INSTALL.BAT batch program.
2. Reply "Y", for Yes, when asked if you want to terminate the batch program, INSTALL.BAT.
3. Follow the proper DOS procedures in your DOS manual to correct the DOS errors.
4. Repeat the installation procedure for:  
a dual floppy disk system  
(See **STEP FOUR: Installing the Software on a Dual Floppy Disk PC**).  
**OR**  
a hard disk system  
(See **STEP FIVE: Installing the Software on a PC with a Hard Disk**).





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## Appendix B: PCI Technical Reference

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This appendix:

- provides more detailed information concerning the installation and configuration of the PC Interface card
- describes the steps performed during automatic installation
- offers solutions to problems that may arise
- describes each of the software programs used in installation and provides instructions for running them.

This appendix is divided into the following sections:

- PCI Technical Summary
- Installation Process
- CONFIG (the program used to choose Norstar PC Interface configuration setting)
- NORTALK (the Norstar PC Interface Driver Program)
- ROUTER (the program that allows multiple Norstar applications to run at the same time)
- NTEST (the program used to test the PC Interface)
- AUTOMOD (the program used to update the AUTOEXEC.BAT file)

## **PCI Technical Summary**

The PC Interface card and software are used by Meridian Norstar PC applications to communicate with the Meridian Norstar Business Communication System.

The PC Interface card provides a physical connection between the Meridian Norstar system and your PC. The accompanying software program, NORTALK, controls the functioning of the PC Interface card.

The PC Interface card plugs into any unused slot in your PC. It contains a physical switch used for setting the Input/Output (I/O) address and the two Teledapt jacks. The "LINE" jack is used to connect the PC Interface card to the Norstar Business Communication System. The "PHONE" jack is used to connect a Norstar phone to the PC Interface card so they can share the same Norstar line.

The card also requires the use of the following resources in your PC:

- one hardware interrupt
- one software interrupt
- one I/O port address

The resources chosen for use by the PC Interface card must not be used by any other software or hardware you have installed on your PC. The choice of resources is programmable using the CONFIG.EXE program during the installation of the PC Interface software. A description of how to choose the resources is included later in this section.

**I/O Port Address**

The PC Interface card requires the use of 16 bytes of your PC I/O space at the selected I/O address.

The I/O port address must be a hexadecimal number between 200 & 3F0. It must also be a multiple of 16 decimal or 10 hex.

Many of the I/O port addresses are used by other devices in your system. The default value for the I/O port address chosen by CONFIG for the PC Interface card is 300.

The following are recommended as alternatives:

- 280
- 2C0
- 310

The physical address switch settings and the I/O address must correspond in order for the PC Interface card to operate. The CONFIG program automatically sets the PC I/O address; you must set the address switches on the PC Interface card. The following table shows four I/O addresses and their corresponding switch settings.

Move the switches on the PC Interface card to their correct positions, either ON or OFF.

| I/O Address |     | Address Switch Setting |     |    |    |     |
|-------------|-----|------------------------|-----|----|----|-----|
| 280         | ON  | OFF                    | ON  | ON | ON | ON  |
| 2C0         | ON  | OFF                    | OFF | ON | ON | ON  |
| 300         | OFF | ON                     | ON  | ON | ON | ON  |
| 310         | OFF | ON                     | ON  | ON | ON | OFF |

## Hardware Interrupt

The PC Interface card requires a hardware interrupt in the range 2 to 7 hex.

The default value chosen by CONFIG is :

2 for the IBM PC, IBM PC/XT, and IBM PS/2 Model 30

5 for the PC/AT

**This number corresponds to the hardware interrupt number and not the interrupt position in the interrupt vector table.**

Many of your PC's hardware interrupts are in use by other devices such as disk drives, communication devices, and printers. You must choose a hardware interrupt that is not in use by another device in your machine.

On an IBM PC/AT, or compatible computer, the following hardware interrupts are recommended:

7 (if no parallel printer is in use)

5

3 (if COM2 is not in use)

**Interrupt 2 should not be used on an IBM PC /AT, or compatible.**

On an IBM PC, IBM PC/XT, or compatible computer, or on an IBM PS/2 Model 30, the following hardware interrupts are recommended:

7 (if no parallel printer is in use)

3 (if com 2 is not in use)

2

The following table lists the devices that are normally assigned to hardware interrupts for the PC/XT and PC/AT:

|     | PC/AT                                           | PC/XT                                   |
|-----|-------------------------------------------------|-----------------------------------------|
| No. | Device                                          | Device                                  |
| 00  | Timer                                           | Timer                                   |
| 01  | Keyboard                                        | Keyboard                                |
| 02  | Used by second interrupt controller for cascade | Reserved                                |
| 03  | Asynchronous Communications (Alternate)         | Asynchronous Communications (Alternate) |
| 04  | Asynchronous Communications (Primary)           | Asynchronous Communications (Primary)   |
| 05  | Parallel Port                                   | Fixed Disk                              |
| 06  | Diskette Controller                             | Diskette Controller                     |
| 07  | Printer                                         | Printer                                 |



## Software Interrupts

The PC Interface card requires a software interrupt in the of range 28 to FF hex. The default software interrupt chosen by CONFIG is 78 hex.

**Software interrupts below 67 hex should not be used as they are reserved for use by applications and DOS.**

Only one software interrupt is required. It is recommended that it be chosen from the following ranges:

78-7F hex

**OR**

68-6F hex

## DMA Channel

The PC Interface card can use a DMA channel when it transfers large amounts of data. The PC Interface card can be configured to use DMA channels 1, 2, or 3. Normally the PC Interface card is configured so that the DMA channel is disabled. Only enable the DMA channel when a particular Norstar PC application requests use of the DMA channel.

The PC Interface card should use the following DMA channel with the following equipment:

- channel 1 with an IBM PC/XT
- channels 1 or 3 with an IBM PC/AT

The following table lists the normal uses for each DMA channel for the IBM PC/XT and PC/AT:

|           | PC/XT                | PC/AT               |
|-----------|----------------------|---------------------|
| Channel # | Device               | Device              |
| 0         | memory refresh       | memory refresh      |
| 1         | SDLC                 | SDLC                |
| 2         | Diskette Controller  | Diskette Controller |
| 3         | Hard Disk Controller | Reserved            |



## **Installation Process**

There are several steps involved in the installation of the PC Interface card and software. This installation can be performed automatically by the supplied batch program, INSTALL.BAT, or manually by following the steps below.

### **To manually install the PC Interface software:**

1. Create the directory \NORSTAR and the subdirectory \NORSTAR\SYS on drive C. Copy all the files on the **PC Interface Software Disk** into the subdirectory \NORSTAR\SYS. Rename the file E\_LANG.DAT to LANGUAGE.DAT.
2. Choose a configuration for your system. This is done by running the program CONFIG.EXE which chooses configuration settings that identify the resources used by NORTALK and the PC Interface card. CONFIG selects a configuration for your PC. CONFIG creates NORSTAR.BAT in the directory \NORSTAR\SYS and writes the commands to run NORTALK.EXE and ROUTER.EXE with the chosen configuration settings into NORSTAR.BAT.
3. Run the batch program NORSTAR.BAT. This causes the NORTALK.EXE and ROUTER.EXE programs to be run with the chosen configuration settings.
4. Run the NTEST.EXE program to verify that the PC Interface is functioning properly. NTEST.EXE creates the SYSTEM.DAT file.
5. Run the AUTOMOD.EXE program. This copies the contents of the NORSTAR.BAT file into the AUTOEXEC.BAT file so that NORTALK and ROUTER run every time the PC is turned ON.

### **If an automatic installation process fails:**

1. Read this appendix and find the error description which is associated with the failure.
2. Follow the procedures provided to solve the problem.
3. Repeat the automatic installation process.

**CONFIG** The CONFIG program is run to choose configuration settings that specify the PC resources used by NORTALK and the PC Interface card. These configuration settings are saved in the NORSTAR.BAT file in the \NORSTAR\SYS directory as command line parameters to NORTALK.

During automatic installation, CONFIG runs and chooses default configuration settings that work on most PCs, as long as they do not contain other installed hardware. You may also choose your own configuration settings using CONFIG.

---

**To Run  
CONFIG:**

1. Type `cd \norstar\sys`
2. Press
3. Type `config`
4. Press

The screen displays three choices:

- **A** Automatic Configuration
- **M** Manual Configuration
- **X** Exits to DOS

---

**Automatic  
Configuration**

When you choose automatic configuration, the software determines what type of PC you have and selects configuration settings that are most likely to work on it. You do not have to enter any commands into the PC.

During automatic installation using the INSTALL.BAT program, automatic configuration is performed by running CONFIG with the command option **/a**. This has the same effect as choosing **Automatic** from the Configuration main menu.

The chosen configuration is recorded in the CONFIG.DAT file. Once created, this file can only be changed by:

- manual configuration
- OR**
- deleting the file and running the CONFIG program again using the **/a** option.

## Manual Configuration

If you have installed other hardware in your PC, the settings chosen by automatic configuration may not be compatible with the other hardware. Your existing applications or the Meridian Norstar PC applications may not work. To correct any possible problems, you may need to perform manual configuration. When manual configuration is selected, a screen similar to the one below, displays the current value of the configuration settings as found in NORSTAR.BAT, or the default configuration settings if NORSTAR.BAT does not exist (Figure B.1).

| Parameter                                                | Setting                               | Function Keys                                  |
|----------------------------------------------------------|---------------------------------------|------------------------------------------------|
| < Custom Setting >                                       |                                       |                                                |
| PCI Card Physical address (Hex)<br>(200 through 3F0)     | 300                                   | F1: Save and Continue                          |
| Software interrupt<br>(68 through FF)                    | 78                                    | F2: Retrieve Saved Configuration               |
| Hardware interrupt<br>(IRQ 2 through IRQ 7)              | 5                                     | F3: AUTOMATIC PC/XT Setting                    |
| Check for hardware interrupt<br>vector changes. (Y or N) | <input checked="" type="checkbox"/> N | F4: Another PC/XT Setting                      |
| DMA Channel Setting                                      | Off                                   | F5: AUTOMATIC AT Setting                       |
|                                                          |                                       | F6: Another AT Setting                         |
|                                                          |                                       | F7: Change DMA Channel Setting<br>1,2,3 or Off |
|                                                          |                                       | F10: Quit                                      |

Figure B.1 Manual Configuration screen

CONFIG.EXE provides two sets of pre-defined configuration settings:

- settings for the IBM PC, PC/XT, and compatible computers, and for the IBM PS/2 Model 30
- settings for the IBM PC/AT

The configurations labeled "Automatic" are used during automatic configuration. If automatic configuration fails, try the alternate setting for your type of PC. You can view the alternate settings by pressing the appropriate function key. The settings are saved in NORSTAR.BAT only after you press F1 (Save and Continue).



## Creating a Custom Configuration

If the automatic or the alternate preset configuration settings do not work, you will have to create a custom configuration.

First, you should determine the resources being used by other hardware and software components in your PC. This information is usually found in the manuals that came with your other hardware and software. For more information, see **PCI Technical Summary** in this appendix.

To choose a custom configuration using the manual configuration screen:

1. Use the cursor control keys to move to the parameter you want to change.
2. Press **Enter**. The cursor now appears under the parameter setting you want to change. You can only change the parameter when the cursor appears beneath it.
3. Make your change to the parameter setting by typing in the required information. The new parameter setting appears over the old one.
4. Press **Enter**. Once you change a parameter, the configuration heading shows "Custom Setting".
5. Once you have chosen a configuration, press **F1** to save the settings and exit the configuration program.
6. Run AUTOMOD.EXE to properly set the AUTOEXEC.BAT file.
7. Reboot the PC.

The CONFIG.EXE program verifies that the selected I/O address matches the physical switch addresses on the PC Interface card. If the I/O address does not match the card settings, a warning appears and shows you how the card's switches should be set (Figure B.2).

```
Meridian Norstar PC Interface Configuration Program
Press any key to continue
```

### WARNING

```
The Norstar PC Interface Card is NOT responding at the specified
address.
Make sure the card is installed and the switches on the card are
set as shown below.
```

```
Address = 310      Switch Settings
```

```

  ↓
on  [↑↓↑↓↑↓↑↓]
     1 2 3 4 5
```

Figure B.2 Warning screen example

**To set the switches:**

1. Write down the settings indicated on the screen.
  2. Follow the procedures for setting the switches found in **STEP TWO: Installing the PCI Card.**
  3. Remember to use the address switch settings you have written down and not the default 300 hex I/O port address.
- 

**Running CONFIG  
after PC  
Applications  
have been  
Installed**

When Norstar PC applications are installed on your PC, the configuration programs provided with these applications modify the NORSTAR.BAT file to include the commands that must be run to load the applications.

If the CONFIG program is run after these application configuration programs have been run, the CONFIG program will only modify the command line in the NORSTAR.BAT file that runs NORTALK.

If you want to create a NORSTAR.BAT file that runs only the NORTALK program, delete the NORSTAR.BAT file and run the CONFIG program using the automatic option.



## NORTALK

The NORTALK program provides the link between Meridian Norstar PC applications and the physical hardware in your PC. The configuration settings used by NORTALK to locate and communicate with the PC Interface card are passed to NORTALK as command line parameters.

This section describes the NORTALK command line syntax and lists errors associated with running NORTALK.

### NORTALK Command Line Syntax

The syntax of the NORTALK command line is as follows:

```
nortalk [/pxxx] [/ix] [/sxx] [/c] [/dx]
```

- [ ] indicates optional parameters
- x is a hexadecimal number
- /p controls the I/O address; the default is 300H
- /i controls the hardware interrupt; the default is 3
- /s controls the software interrupt; the default is 78 H
- /c turns the check option ON; the default is OFF
- /d selects a DMA channel; default is OFF

**The CONFIG program chooses defaults for the hardware interrupt based on the type of PC. The defaults used by NORTALK might be different from the defaults chosen by CONFIG.**

### Parameter Specifications

Parameters are specified according to the following rules:

- All parameters must begin with a forward slash (/).
- The slash is followed by a command which must be a lower-case character.
- The installation aborts if the command character is invalid.
- Each command is followed by a fixed-length field of hex characters which in turn is followed by a space or an end-of-line. If the length of a hex-character field is incorrect, the installation is aborted.
- The following characters are valid hex input:
  - 0 - 9
  - a - f
  - A - F

Any other characters abort the installation. The range of the hex values in some fields have additional constraints placed upon them. The system ignores any command not preceded with a slash. For example, in the command string: "**nortalk check option /c**", the system would execute **"/c"** and ignore **"check"** and **"option"**.

### **Managing Interrupt Vectors: The Check Option**

PC programs that install a hardware interrupt vector after NORTALK has been run, may not work properly. Typically, this includes communication programs that use the serial port and programs that have custom printer routines not installed as resident device drivers.

NORTALK supports a "check" option (/c) that tells NORTALK to periodically check for new hardware interrupt vector installations and accommodate them. You should enable this option using CONFIG if you encounter difficulty with your foreground programs.

Turning the check option ON makes NORTALK periodically check for new hardware interrupt vector installations. If a new hardware interrupt vector is detected, NORTALK ensures that Meridian Norstar PC applications do not interfere with the foreground program.

---

### **Using a DMA Channel**

Only install NORTALK with a DMA channel selected if you will be installing a PC application that requires a DMA channel.

## NORTALK Errors

When NORTALK is run during initial installation or during a PC reboot, a number of errors may occur. When an error occurs, NORTALK displays an error number along with a brief description of the error.

**Note:** If an error occurs, NORTALK pauses the screen until you press any key.

The following is a description of each of the errors and what you should do if they occur:

### Installation ERROR #1: The PCI Card is not responding.

The PC Interface card is not responding at the I/O address that NORTALK.EXE has been configured to use. This can result from a number of conditions:

- The PC Interface card is not installed.
- The switches on the PC Interface card are not set correctly.
- Other installed hardware has been configured to use the same address.
- The PC Interface card is not functioning correctly.

#### Solution:

1. Make sure the PC Interface card is installed and seated firmly in the PC bus slot.
2. Verify that the address switches and the I/O configuration setting are the same.
3. Run CONFIG and select Manual Configuration.
4. Select the custom configuration settings, press **F1** to save, and continue. The software checks the physical switch address settings against the settings chosen by the software. If they do not match the correct settings for the address switches, the correct setting is displayed.

#### OR

If you have other cards installed in your PC, check to see if any of them use the same I/O addresses or interrupts as the PC Interface card. This information will be contained in the manuals associated with the other cards. If a conflict arises, use the CONFIG program to change the settings for the PC Interface card.



### **Installation ERROR #3: Invalid Port value.**

An invalid I/O port parameter was specified on the NORTALK command line when the AUTOEXEC.BAT file was edited or while NORTALK was run directly from DOS.

#### **Solution:**

1. Run NORTALK by running the batch program NORSTAR.BAT.  
**OR**
1. Run CONFIG.
2. Run AUTOMOD to set the AUTOEXEC.BAT file properly.

### **Installation ERROR #5: Invalid Hardware Interrupt number.**

An invalid hardware interrupt parameter was specified on the NORTALK command line while executing the AUTOEXEC.BAT file or while NORTALK.EXE was run directly from DOS.

#### **Solution:**

1. Run NORTALK by running the batch program NORSTAR.BAT.  
**OR**
1. Run CONFIG.
2. Run AUTOMOD to set the AUTOEXEC.BAT file properly.

### **Installation ERROR #6: Invalid Software Interrupt number.**

An invalid software interrupt parameter was specified on the NORTALK command line while executing the AUTOEXEC.BAT file or while NORTALK.EXE was run directly from DOS.

#### **Solution:**

1. Run NORTALK by running the Batch Program NORSTAR.BAT.  
**OR**
1. Run CONFIG.
2. Run AUTOMOD to properly set the AUTOEXEC.BAT file.

**Installation ERROR #7: Check option has no parameters.**

The check option on the NORTALK command line was specified with unnecessary parameters while executing the AUTOEXEC.BAT file or while NORTALK.EXE was run directly from DOS.

**Solution:**

1. Run NORTALK by running the batch program NORSTAR.BAT.  
OR
1. Run CONFIG.
2. Run AUTOMOD to properly set the AUTOEXEC.BAT file.

**Installation ERROR #8: PCI Card power on diagnostics failed.**

Each time the PC power is turned ON, the PC Interface card runs a number of self tests. If one of these tests fail, NORTALK generates the above error.

**Solution:**

1. Turn your PC OFF.
2. Wait 30 seconds.
3. Turn your PC ON.
4. If the error occurs again, contact your sales representative.



**Installation ERROR #9: Timed out waiting for PCI Card status.**

When NORTALK runs, it checks the status of the PC Interface card. The above error occurs when the PC Interface card status is not received. There may be a conflict with other software or hardware installed in your system.

**Solution:**

1. Change your PC's configuration parameters using the CONFIG program.

**Installation ERROR #10: NORTALK already installed.**

NORTALK only has to be run once after the PC has been powered ON. Running NORTALK a second time generates the above error.

**Solution:**

1. Press any key to terminate the second NORTALK program. The original NORTALK program continues to run. You can now run the desired Meridian Norstar PC application program.
2. Check your AUTOEXEC.BAT file to see if it contains multiple commands to run NORTALK.

**Installation ERROR #11: Invalid DMA channel number selected.**

An invalid DMA channel number has been specified. Only DMA channels 1 through 3 may be used.

**Solution:**

1. Use CONFIG to specify the DMA channel you wish to use.  
**OR**  
Specify a DMA channel number between 1 and 3.

**Installation ERROR #14: This PCI Card does not have DMA.**

You have installed a PC Interface card that does not support DMA. If your Norstar application requires DMA, you will have to purchase a PC Interface card that has this capability.

**After running NORTALK, your PC no longer responds to keyboard input.**

This error occurs when:

- the PC Interface card and software are using the same resources as other software and hardware
- other memory resident programs are incompatible with NORTALK

**Solution:**

1. If you have other cards installed in your PC, check to see if the other cards are using the same I/O addresses or interrupts as the PC Interface card. If this is the case, use the CONFIG program to change the settings of the PC Interface card.
2. If step 1 above is unsuccessful, unload all memory resident programs and only run NORTALK. If your PC works, load the resident programs, one at a time, until you identify the resident program which is incompatible. See the error explanation below.

**Other manufacturers' memory resident programs do not work.**

When other manufacturers' memory resident programs no longer work:

**Solution:**

1. In the AUTOEXEC.BAT file, change the order that the memory resident programs are loaded.  
**OR**  
A resource conflict may exist; change the configuration settings of the PC Interface card using the CONFIG program.

### **Application programs do not work**

This error occurs when application programs do not function correctly after NORTALK has been run.

NORTALK modifies and maps the DOS interrupt vector table. If an application program installs an interrupt vector after NORTALK has been run, the application program may not work properly. Turning the /c (check) option ON causes NORTALK to check for new hardware interrupt vectors.

#### **Solution:**

1. Use CONFIG to turn the check option ON in NORTALK.

Application programs that use a communication card in the PC may stop functioning when a Norstar PC application that uses a DMA channel is installed. This indicates that there is a conflict over the use of the selected DMA channel.

#### **Solution:**

1. Use the CONFIG program to turn the DMA channel OFF.

If this corrects the problem, use the CONFIG program to choose a different DMA channel.

## ROUTER

The ROUTER.EXE program is a resident program that allows up to 16 Norstar PC applications to run on your Norstar system at the same time.

The ROUTER supports a number of command line switches to control the following:

1. the size of the event queue
2. the size of the receive buffer
3. whether or not the CTRL-ALT -DEL sequence is trapped

Previously, these parameters were determined by an application when it registered with NORTALK. Since applications no longer have direct access to NORTALK or exclusive control over its operation, another manner of setting these parameters has been chosen.

Normally, the default values for these switches will be appropriate.

The switches are defined as follows:

**/x** Disable trapping of the CTRL-ALT-DEL sequence.

**Default:** CTRL-ALT-DEL sequence is trapped.

**Example:** `router /x`  
(disable trapping)

**/e<hex number>** Set the size of the NORTALK event quene. The size is specified in hex and identifies the number of event records. Each event record is 8 bytes long so that the number of memory allocated is equal to 8 times the size specified.

**Default:** 40 hex (64 decimal)

**Example:** `router /e20`  
(support 20 (32 decimal) events)

**/r<hex number>** Set the size of the NORTALK receive buffer. The size is specified in hex and identifies the number of bytes to allocate for the receive buffer.

**Default:** 1000 hex (4096 decima)

**Example:** `router /r200`  
(buffer of 200 (512 decimal bytes)).



## ROUTER Errors

The ROUTER program must be run immediately after the NORTALK program is run and before any other Norstar PC application.

**Router ERROR #1: NORTALK is not installed.**

### Solution:

1. The NORTALK.EXE program must be run before the ROUTER.EXE program is run. **Router ERROR #1: NORTALK is not installed.**

**Router ERROR #2: Another program is already using NORTALK.**

### Solution:

1. The ROUTER.EXE program must be run immediately after the NORTALK.EXE program and before any Norstar PC applications.

**Router ERROR #4: Router already installed.**

### Solution:

1. ROUTER.EXE has already been run. The ROUTER only has to be run once.

**Router ERROR #5: Invalid switch option.**

### Solution:

1. An invalid command line switch was specified.

**Router ERROR #6: Invalid event queue size.**

### Solution:

1. The size specified as part of the /e switch was invalid.

**Router ERROR #7: Invalid receive buffer size.**

### Solution:

1. The size specified as part the /r switch was invalid.



**NTEST** The NTEST program is an application that tests whether or not the PC Interface card and NORTALK have been installed properly.

When NTEST runs, it first goes through an initialization process with the program NORTALK. This initialization process ensures that the PC Interface software is functioning properly. If this initialization fails, NTEST terminates and displays an error number and message.

The following is a description of each of the errors and what you should do if they occur:

**ERROR #1: The PCI Card is not connected to the Norstar system**

**Solution:**

1. Connect the PC Interface Card to the Norstar Business Communication System by plugging one end of the line cord into the Teledapt jack labeled "LINE" on the PC Interface card and the other end of the line cord into the Meridian Norstar Teledapt jack on the wall.

**ERROR #2: Memory Allocation Error**

Your PC did not have enough internal memory to run NTEST.

**Solution:**

1. Reboot your PC and run NTEST again.

**ERROR #4: The Norstar PC Interface driver NORTALK.EXE is not running.**

**ERROR #5: The Norstar PC Interface program ROUTER.EXE is not running.**

Before a Meridian Norstar PC application such as NTEST can run, you must run both NORTALK.EXE and ROUTER.EXE.

**Solution:**

1. Run the batch program NORSTAR.BAT found in the directory \NORSTAR\SYS.

**ERROR #7: No feature codes available.**

The Norstar System provides 100 Feature Codes for use by Norstar PC applications. When a Norstar PC application runs, it requests a Feature Code from the Feature Code Administration program in the Norstar System. If all the Feature Codes are assigned to PC applications, the NTEST program can not run. It is unlikely that all the Features Codes would be assigned.

**Solution:**

1. Ask your System Coordinator to check the Feature Code Administration tables to verify if any Feature Codes are available and make any necessary corrections to the tables.

**Error #8: System Administration is busy with another user.**

When the NTEST program runs, it requests a Feature Code from the Feature Code Administration program in the Norstar System. If another Norstar PC application is using the Feature Code Administration program, the NTEST program can not get a Feature Code.

**Although NTEST was unable to obtain a Feature Code, it was able to communicate with the Feature Code Administration program. This proves that the PC Interface card and software have been properly installed.**

**Solution:**

1. Run the NTEST program again.

## AUTOMOD

The AUTOMOD program copies the contents of the NORSTAR.BAT file into the AUTOEXEC.BAT file to allow automatic installation of NORTALK.

The NORSTAR.BAT file, in the directory \NORSTAR\SYS, is created by the CONFIG program and contains the command to run NORTALK with the specified configuration settings as command line parameters.

If you do not have an AUTOEXEC.BAT file, then one is created when you run AUTOMOD. If you do have an AUTOEXEC.BAT, it is saved in a file called AUTOEXEC.OLD. A new AUTOEXEC.BAT is created and contains the contents of your old AUTOEXEC.BAT file plus the contents of NORSTAR.BAT.

In the AUTOEXEC.BAT file, the contents of the NORSTAR.BAT file are preceded and followed by the command REM NORSTAR as shown in the following example:

```
REM NORSTAR
CD \NORSTAR\SYS
NORTALK /pxxx /sxx /ix
CD \
REM NORSTAR
```

The REM NORSTAR commands are used by AUTOMOD to locate the NORSTAR commands when AUTOMOD is used to update the AUTOEXEC.BAT file. When AUTOMOD is run, it looks for the REM NORSTAR commands in the AUTOEXEC.BAT file. If AUTOMOD finds the REM NORSTAR commands, it removes all the commands between the two REM NORSTAR lines and replaces the deleted lines with the contents of NORSTAR.BAT.

The location of the commands, from NORSTAR.BAT, in the AUTOEXEC.BAT file is determined by command line parameters to AUTOMOD. These command line parameters are:

|                   |                                                                                                                                              |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>automod</b>    | replaces the commands where they are, or if they are not in the AUTOEXEC.BAT file, places the commands at the start of the AUTOEXEC.BAT file |
| <b>automod /e</b> | places the commands at the end of the file                                                                                                   |
| <b>automod /r</b> | removes the commands from the AUTOEXEC.BAT file                                                                                              |
| <b>automod /s</b> | places the commands at the start of the file                                                                                                 |



### **Updating AUTOEXEC.BAT by Yourself**

You may want to update your AUTOEXEC.BAT file yourself, without using AUTOMOD.

The NORSTAR.BAT file in the directory \NORSTAR\SYS is created by the CONFIG program and contains the command to run NORTALK with configuration settings specified as command line parameters. Copy the contents of NORSTAR.BAT into AUTOEXEC.BAT at the desired location.

**CAUTION: Do not change the contents of NORSTAR.BAT or the PC Interface software will not function correctly.**

### **Updating after Installing a Meridian Norstar Application**

Automatic installation of a Meridian Norstar PC application updates NORSTAR.BAT so that it contains the commands to run the PC application.

After a Meridian Norstar PC application is installed, AUTOMOD must be run. This copies the contents of NORSTAR.BAT into the AUTOEXEC.BAT file to allow the PC application to run. The contents of NORSTAR.BAT are automatically copied into the AUTOEXEC.BAT file during automatic installation of the PC application.

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## Appendix C: Meridian Norstar PC Interface Files

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### Directory Structure

A directory structure is created when the Meridian Norstar PC Interface software is installed in your PC.

The directory \NORSTAR is created at the root of the directory structure. All of the PC Interface software is installed in a sub-directory \SYS under the \NORSTAR directory.

**CAUTION:** Do not delete any of the files found in \NORSTAR\SYS.

---

### COPIED FILES

A number of files are copied into the directory \NORSTAR\SYS when the PC Interface software is installed.

The following is a description of each of these files:

---

|             |                                                                                                                                                             |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NORTALK.EXE | This file is the Meridian Norstar PC Interface driver program that allows Meridian Norstar PC applications to communicate with the Meridian Norstar system. |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|            |                                                                           |
|------------|---------------------------------------------------------------------------|
| CONFIG.EXE | This file is used to set the Meridian Norstar PC Interface configuration. |
|------------|---------------------------------------------------------------------------|

---

|                          |                                                                  |
|--------------------------|------------------------------------------------------------------|
| CONFIG.ENG<br>CONFIG.FRA | These files may contain the various language prompts for CONFIG. |
|--------------------------|------------------------------------------------------------------|

---

|            |                                                                                                                                                                     |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ROUTER.EXE | A resident program that attaches to the NORTALK program. It allows you to run up to 16 Norstar PC applications (15 applications and 1 foreground) at the same time. |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---



|           |                                                                                                          |
|-----------|----------------------------------------------------------------------------------------------------------|
| NTEST.EXE | This file is used to verify that the PC Interface card and software are functioning properly in your PC. |
|-----------|----------------------------------------------------------------------------------------------------------|

---

|                        |                                                             |
|------------------------|-------------------------------------------------------------|
| NTEST.ENG<br>NTEST.FRA | These files contain the various language prompts for NTEST. |
|------------------------|-------------------------------------------------------------|

---

|             |                                                    |
|-------------|----------------------------------------------------|
| AUTOMOD.EXE | This file is used to update the AUTOEXEC.BAT file. |
|-------------|----------------------------------------------------|

---

|                          |                                                                                         |
|--------------------------|-----------------------------------------------------------------------------------------|
| <b>CREATED<br/>FILES</b> | These files are created and placed in \NORSTAR\SYS as part of the installation process. |
|--------------------------|-----------------------------------------------------------------------------------------|

---

|             |                                                                                                                                                                             |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NORSTAR.BAT | This file contains the commands to run the PC Interface driver program, NORTALK.EXE. The PC Interface configuration is specified as command line parameters to NORTALK.EXE. |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|            |                                                                                    |
|------------|------------------------------------------------------------------------------------|
| CONFIG.DAT | This file is used by CONFIG.EXE to save the PC Interface configuration parameters. |
|------------|------------------------------------------------------------------------------------|

---

|            |                                                                                                                                                                                   |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SYSTEM.DAT | This file contains information that describes the versions of the KSU, PC Interface and NORTALK software that you are using. This information is used by Norstar PC applications. |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

---

|              |                                                             |
|--------------|-------------------------------------------------------------|
| LANGUAGE.DAT | This file defines the prompt language used in the software. |
|--------------|-------------------------------------------------------------|

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## Appendix D: PC Compatibility

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The PC Interface card and software have been designed for maximum compatibility with other PC hardware and software. The hardware allows a choice of 32 different I/O addresses and any hardware interrupt line from 2 to 7 hex to be used with the PC Interface card. The software allows any software interrupt number from 28 to FF hex to be used by the NORTALK.EXE device driver program.

---

### **PC Compatibility**

The PC Interface card is known to work with the following PCs:

IBM PC  
IBM PC/XT  
IBM PC/AT  
IBM PS/2 Model 30  
Compaq Portable\*  
Compaq Deskpro 286\*  
Tandy Model 3000\*  
Epson Equity III\*

---

### **PC Expansion Card Compatibility**

The PC Interface card is known to work with the following PC expansion cards:

IBM Monochrome Display Adapter  
Hercules\* Display Adapter

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\* Compaq Portable and Compaq Deskpro 286 are trademarks of Compaq Computer Corporation.

\* Tandy Model 3000 is a trademark of Tandy Corporation.

\* Epson Equity III is a trademark of Epson America, Inc.

\* Hercules is a trademark of Hercules Computer Technology.

## **PC Application Software Compatibility**

The following foreground PC applications are known to work with NORTALK.EXE resident in the background:

Microsoft Word\*  
dBase III/Plus\*  
Lotus 1-2-3\*  
Smalltalk/V\*  
WordStar\*

---

## **Background Application Software Compatibility**

As there are no standards for DOS Terminate-and-Stay-Resident programs, compatibility with other background programs cannot be guaranteed. The following background applications are known to co-reside properly with NORTALK.EXE:

Sidekick\*  
Prokey 4.0\*

\*Microsoft Word is a trademark of Microsoft Corporation.

\*dBase III/Plus is a trademark of Ashton-Tate Corporation.

\*Lotus 1-2-3 is a trademark of Lotus Development Corporation.

\*Smalltalk/V is a trademark of Digital Inc.

\*Word Star is a trademark of Micropro Corp.

\*Sidekick is a trademark of Borland International Inc.

\*Prokey 4.0 is a trademark of Idea Ware Inc.

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## Appendix E: Creating a Custom Boot Disk

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You may already have a DOS boot disk that you use in your day-to-day business. If you prefer to continue using this boot disk rather than the **Norstar System Disk**, you can install the Norstar System files directly on your existing boot disk.

**Note:** Your boot disk must have a minimum of 160K free bytes to accomodate the Norstar System files. You may also need additional space if you plan to install additional Norstar PC Application programs on the same disk.

### Creating a Backup of Your Boot Disk

Make a backup of your boot disk before you begin installing the Norstar system files on your boot disk.

1. Place your DOS disk that contains the Diskcopy program (DISKCOPY.EXE) in drive A.
2. Type **a :**
3. Press
4. Type **diskcopy a: b :**
5. Press  The Diskcopy program prompts you to place the source disk in drive A.
6. Remove the DOS disk from drive A and insert your original DOS boot disk.
7. Press  The Diskcopy program prompts you to place the destination disk in drive B.
8. Place a new disk in drive B. If the disk is unformatted, you will need to format it.



**Caution:** The Diskcopy program destroys all information previously stored on the destination disk in drive B and replaces it with the information stored on the source disk in drive A.

9. Press  The Diskcopy program copies all the information stored on the source disk in drive A onto the disk in drive B.

## Installing the Norstar System Files on Your DOS Boot Disk

1. Place the **PC Interface Software Disk** in drive A.
2. Place your DOS boot disk in drive B.
3. Type **a:install b:**
4. Press  The **INSTALL.BAT** program on the **PC Interface Software Disk** copies the appropriate files onto your DOS boot disk.

---

## Appendix F: Attached Set Requirements

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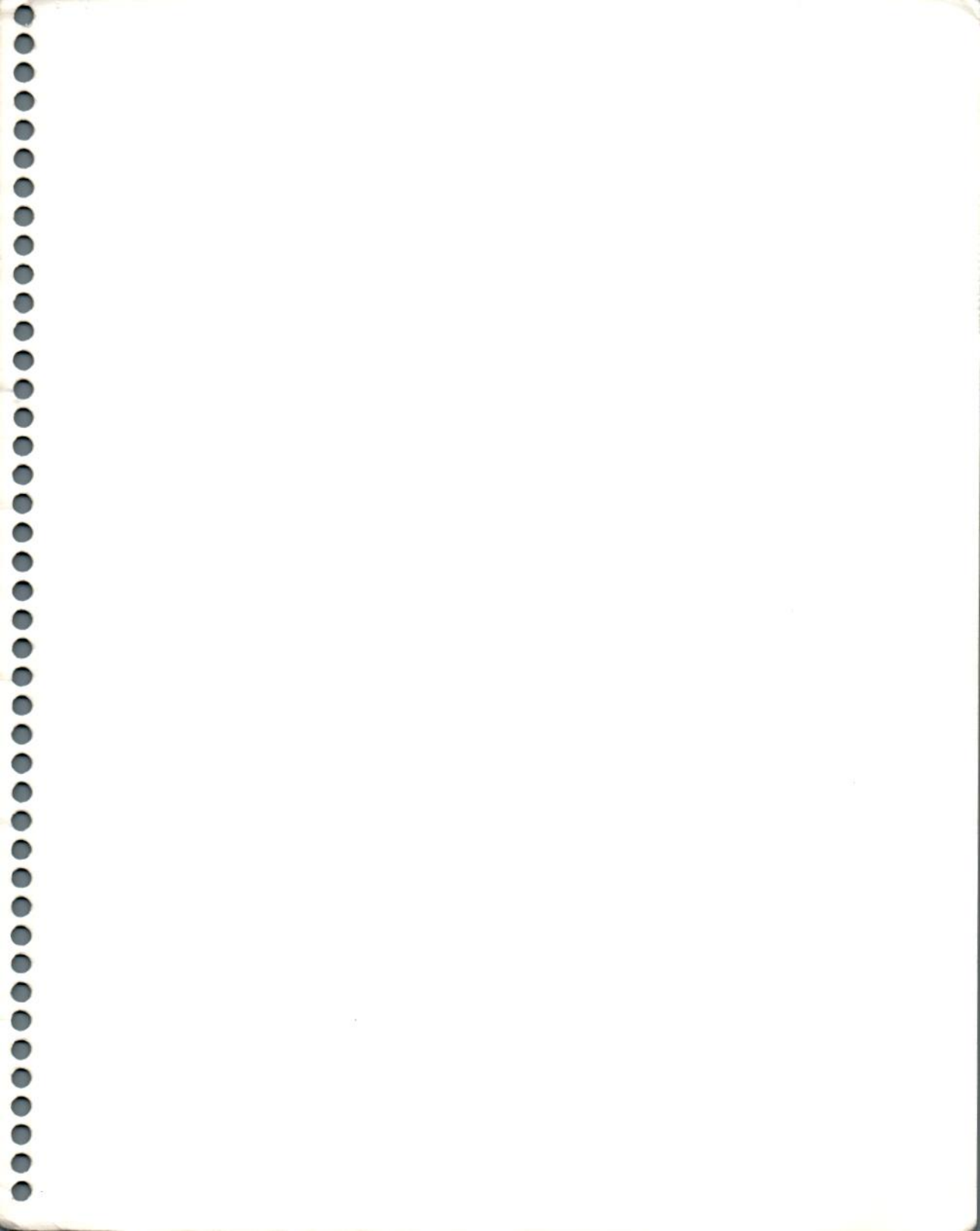
The PC Interface card does not need a dedicated Norstar phone line. It can share a phone line with one of the following Norstar phones:

- M7208
- M7310 (may be equipped with a busy lamp field)
- M7324 (may be equipped with a busy lamp field)
- M7324 with an attached Central Answering Position

In addition, you must meet the following requirements:

- The Teledapt line cord that connects the phone to the PC Interface card (PHONE Jack) must be no longer than 15 m (50 ft).
- If the telephone line that connects the PC Interface card to the Norstar KSU is longer than 304 m (1000 ft), you must install a loop power supply to provide power to the Norstar telephone when the PC is not ON.
- The telephone line that connects the PC Interface card to the Norstar KSU must be no longer than 853 m (2800 ft).







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